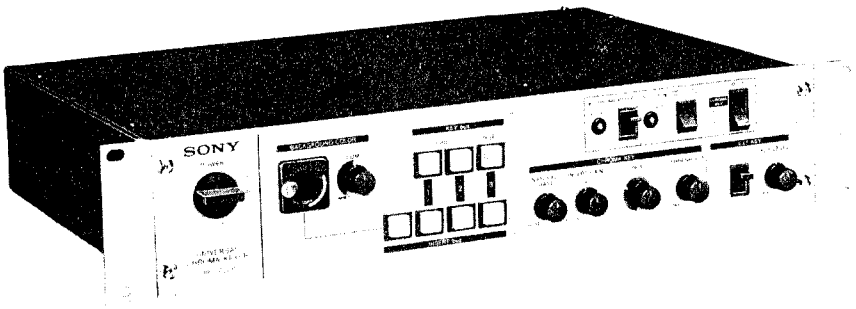
CRK-2000
CRK-2000P
CRK-2000PM



SONY®

SERVICE MANUAL

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

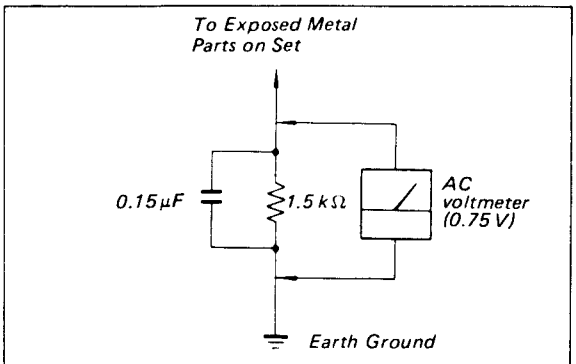


Fig. A. Using an AC voltmeter to check AC leakage.

SPECIFICATIONS

Signal system
CRK-2000: EIA standards, NTSC color system
CRK-2000P: CCIR standards, PAL color system
CRK-2000PM: CCIR standards, PAL-M color system

Inputs
VIDEO IN 1/2/3 (ENCODED) connectors (BNC)
1 Vp-p (VBS), 75 ohms, unbalanced
R/G/B connectors (BNC)
1 Vp-p (V), 75 ohms, unbalanced
EXT KEY connector (BNC)
0.7 Vp-p (V) or 1 Vp-p (VS), 75 ohms, unbalanced, with 75 ohm termination switch
B/W CAMERA connector (DIN 6-pin)
0.7 Vp-p (V) or 1 Vp-p (VS), 75 ohms, unbalanced (parallel connction with the BNC type EXT KEY connector)
GEN LOCK IN connector (BNC)
0.3 Vp-p (BS)

Outputs
CHROMA KEY OUT 1/2 connectors (BNC)
1 Vp-p (VBS), 75 ohms, unbalanced
DP: 2.5° (in LINE SEL mode)
DG: 2.5% (in LINE SEL mode)
Frequency response: 5 MHz ±1 dB
VIDEO OUT 1/2/3 connectors (BNC)
1 Vp-p (VBS), 75 ohms, unbalanced
(0.5 μsec delay output of the corresponding VIDEO IN connector)
DP: 1.5°
DG: 1.5%
Frequency response: 5 MHz ±1 dB
BLACK BURST OUT connectors (BNC)
0.3 Vp-p (BS)
GEN LOCK OUT connector (BNC)
0.3 Vp-p (BS)
(loop-through output of the GEN LOCK IN connector)

Tally/intercom
SEG TALLY/INTERCOM CAMERA TALLY/ INTERCOM connectors (DIN 4-pin) ×3 each
CHROMA KEY TALLY connector (DIN 4-pin)

Background color generator
Chroma: 0 — 700 mVp-p variable according to the hue level
Hue: 0° — 360°
Luminance (Y): 0 — 500 mV continuously variable

Power requirements
CRK-2000: 120 Vac ±10%, 50/60 Hz
CRK-2000P/PM: 110, 127, 220 or 240 Vac ±10% (selectable), 50/60 Hz

Power consumption
29 W

Operating temperature
0°C to 40°C (32°F to 104°F)

Dimensions
482 × 88 × 300 mm (w/h/d)
(19 × 3½ × 11⅞ inches)
not incl. projecting parts and controls

Weight
7 kg (15 lb 7 oz)

Supplied accessories
Chroma key cloth (blue) 1
AC power cord 1

While the information given is true at the time of printing, small production changes in the course of our company's policy of improvement through research and design might not necessarily be indicated in the specifications. We would ask you to check with your appointed Sony dealer if clarification on any point is required.

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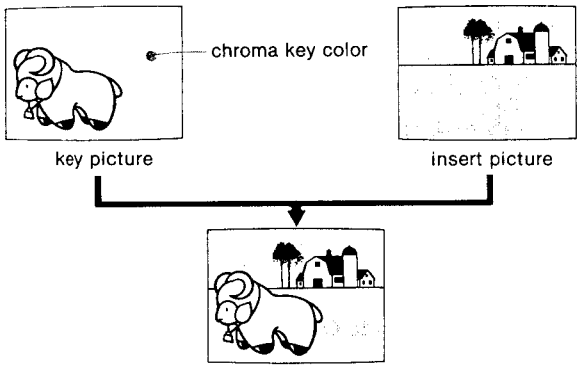
SECTION 1
GENERAL DESCRIPTION

The CRK-2000/P/PM universal chroma keyer is designed to apply various special effects, such as chroma key, external key and wiping, to your video programs by incorporating three video inputs plus two external key signal inputs.

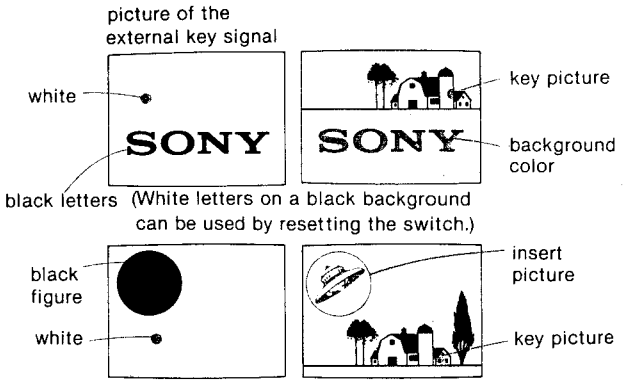
1-1. FEATURES

Chroma key
In the chroma key operation, a specified color called the chroma key color is extracted from one picture ("key picture") and the other picture ("insert picture") is inserted into the area from which the chroma key color was extracted.



The color to be erased can be selected with the HUE control as desired.
Any of the three video inputs can be used either for the "key picture" or for the "insert picture". In addition, a single color background generated by the built-in color generator can be selected for the "insert picture". Hue, chroma and luminance of this background color can be continuously adjusted.
Separate RGB color signals can be connected to one of the three video inputs in parallel with encoded VBS signal for precise RGB chroma keying.

External key
The CRK-2000/P/PM accepts either a B & W camera or a wipe pattern generator as an external key signal source. By connecting a B & W camera, letters can be displayed on the "key picture" with a particular background color or the "insert picture" can be layed out in any desired figure.



With the Sony WEX-2000/P/PM wipe pattern extender, wiping in 84 different wipe patterns is possible for the "key picture" to "insert picture", or vice versa.

Switching function
Any of the three video inputs can be output without applying any effect. This permits the CRK-2000/P/PM to be used as a simple switcher.

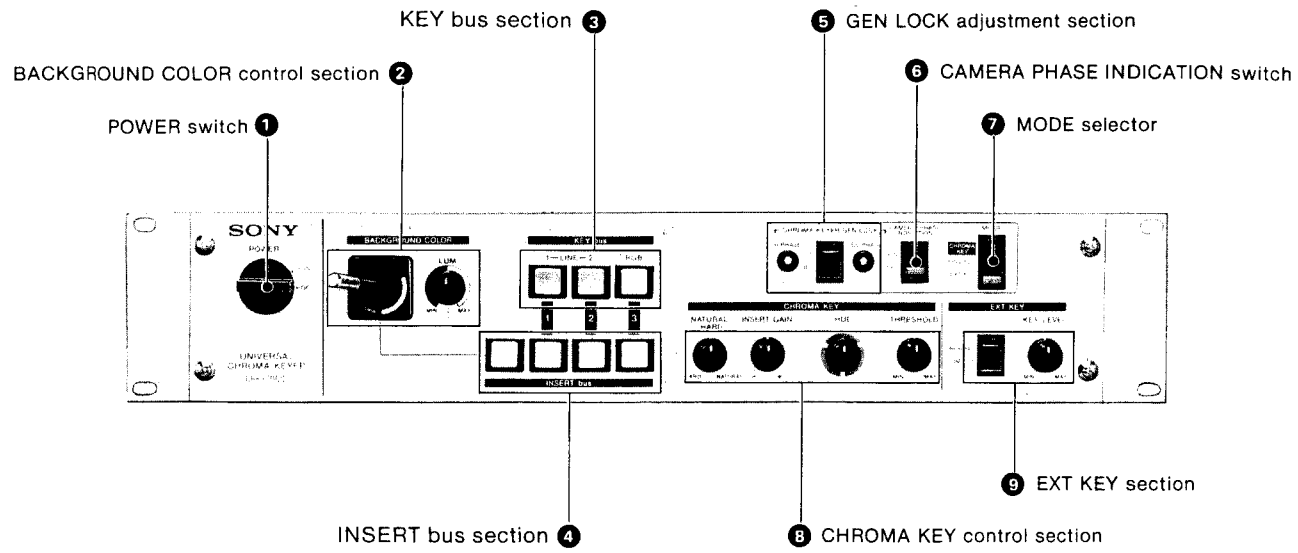
Natural chroma key
In the new natural chroma key process, the luminance information of the "key picture" can create shadows on the "insert picture", thus making the compound picture natural and soft.

Sync signal connectors and phase indicators
The CRK-2000/P/PM can be gen-locked to external sync signals and can relay them to the connected equipment. In addition, a built-in sync generator can generate black burst signals. For easy H and SC phase adjustments of the connected equipment, phase indication patterns can be output to a video monitor.

19-inch rack mounting
The unit is designed to be mounted in a 19-inch EIA standard rack with the SEG-2000 series and WEX-2000, etc.

1-2. LOCATION AND FUNCTION OF PARTS AND CONTROLS

1-2-1. Control Panel

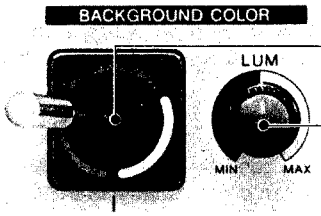


❶ POWER switch

Set the switch to ON to turn on the unit and to OFF to turn it off.

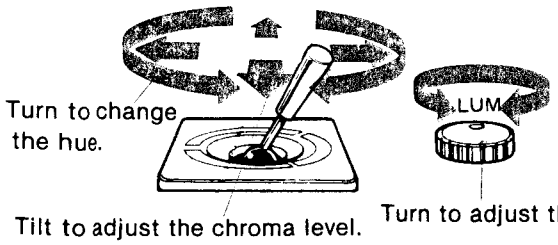
❷ BACKGROUND COLOR control section

Adjust the hue, chroma level and luminance of the background color when the Background button of the INSERT bus section is depressed.

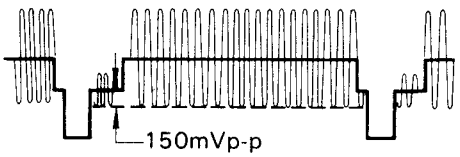


BACKGROUND COLOR joystick
Adjust the hue and chroma level of the background color.

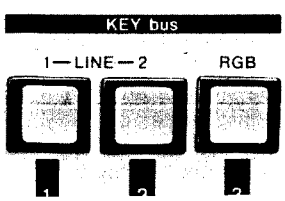
LUM (luminance) control
Adjust the brightness of the background color. Clockwise rotation brightens the color. Normally, set this control in the white range.



CAUTION
When using highly saturated color matting, check (on a waveform monitor) that the chroma level does not fall below the value shown in the illustration. If the LUM control is turned counterclockwise with the chroma level high, picture fluctuation may occur on the equipment connected to the CRK-2000/P/PM.

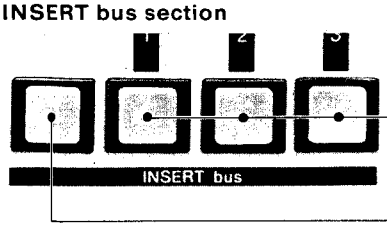


❸ KEY bus section



Select the video input of the key picture.
The LINE 1, 2 and 3 (RGB) buttons correspond to the VIDEO IN 1, 2 and 3 (ENCODED, R, G, B) connectors on the rear panel.

❹ INSERT bus section

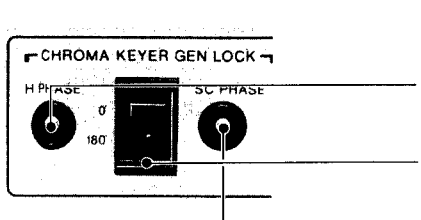


Select the video input of the insert picture during chroma key and external key operations.

INSERT bus buttons 1, 2 and 3 (RGB)
Select the input signal to the VIDEO IN 1, 2 and 3 (ENCODED, R, G, B) connectors on the rear panel.

INSERT bus background color button
Select a color generated by the built-in color generator for the insert signal. The color and brightness can be adjusted by the BACKGROUND COLOR joystick and the LUM control.

❺ GEN LOCK adjustment section



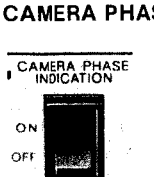
Use to synchronize this unit with the sync signal from the special-effects generator (SEG). Supply the phase indicator pattern from the SEG and adjust the H and SC phases with this pattern.

H. PHASE control screw
Adjust the H. phase.

SC PHASE selector
Switch the subcarrier phase by 180°.

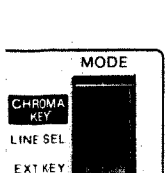
SC PHASE fine control screw
Adjust the subcarrier phase continuously from 0° to 180°.

❻ CAMERA PHASE INDICATION switch



When this switch is set to ON, the phase indicator pattern signal is added to and output with the signal from the CHROMA KEY OUT 2 connector on the rear panel so that the pattern can be used to synchronize the connected cameras with this unit.

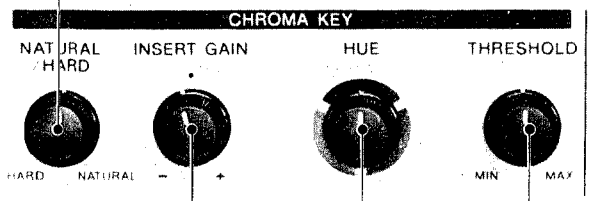
❼ MODE selector



Select the operational mode.
CHROMA KEY: For the chroma key operation.
LINE SEL: To switch three video input signals without any special effects.
EXT KEY: For external key operation using the monochrome camera signal and wipe pattern signal supplied to the EXT KEY connectors on the rear panel.

❽ CHROMA KEY control section

This section is operative when the MODE selector is set to CHROMA KEY.



NATURAL/HARD control
To reflect the shading of the key signal such as the shadow and the creases of the clothes, on the insert picture during chroma key operation, turn the control clockwise.
Set this control to the HARD position when the natural effect is not required.

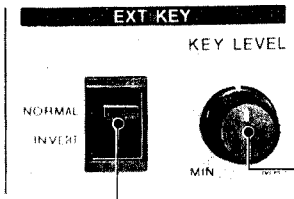
THRESHOLD control
To finely adjust the chroma key color, turn this control.

HUE control
Select the hue of the chroma key color. For example, to make the chroma key color blue, turn the control to the blue zone.

INSERT GAIN control
Adjust the brightness of the insert picture within a ±3 dB range. During chroma key natural effect operation, when the insert picture becomes dark because the luminance of the key picture is low, use this control to compensate. Normally, set the control to the center click position.

❾ EXT KEY (external key) section

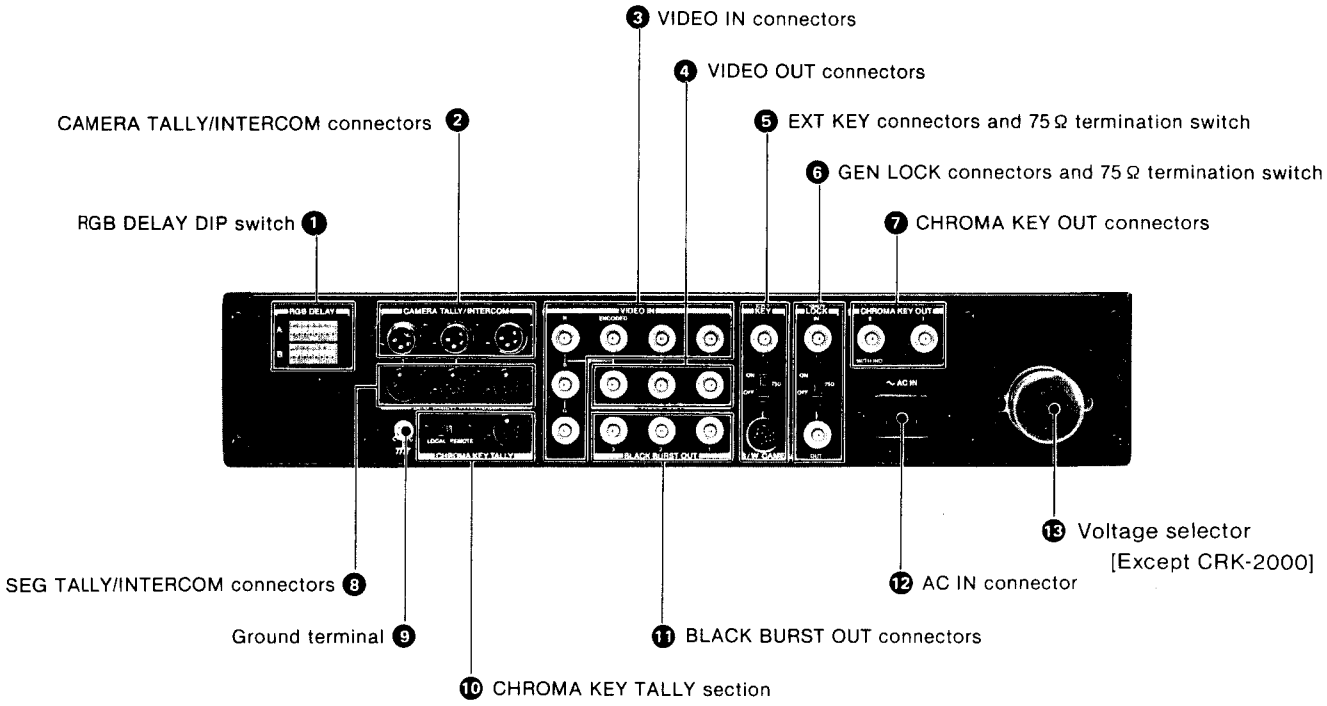
This section is operative when the MODE selector is set to EXT KEY. In the external key operation, either the black or white portion of the monochrome picture input from the EXT KEY B/W CAMERA connector is cut out from the key picture and the insert picture is fitted into the cutont.
You can also wipe the key picture with the insert picture or vice versa with the wipe pattern supplied to the EXT KEY connector.



KEY LEVEL control
This control finely adjusts the external signal luminance level of the black or white portion to be cut out. When using the wipe patterns from the WEX-2000/P/PM, set the KEY LEVEL control to the center position.

NORMAL/INVERT selector
Select whether the black or the white portion of the external key signal is to be cut out from the key picture.
NORMAL: To cut out the black portion
INVERT: To cut out the white portion

1-2-2. Connector Panel

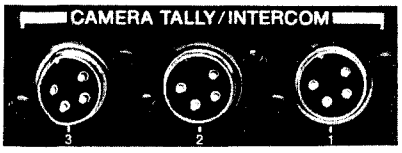

❸ VIDEO IN connectors
❹ VIDEO OUT connectors
CAMERA TALLY/INTERCOM connectors ❷
❺ EXT KEY connectors and 75 Ω termination switch
❻ GEN LOCK connectors and 75 Ω termination switch
RGB DELAY DIP switch ❶
❼ CHROMA KEY OUT connectors
❽ SEG TALLY/INTERCOM connectors
❾ Ground terminal
❿ CHROMA KEY TALLY section
⓫ BLACK BURST OUT connectors
⓬ AC IN connector
⓭ Voltage selector
[Except CRK-2000]

❶ RGB DELAY DIP switches

Adjust the delay* of the R, G and B signals when the signals from the VIDEO IN 3 connectors (ENCODED and R, G, B) are used.
The delay is adjustable in 40 or 50 nsec units. Set the switches according to the camera used. For details, see "SET-UP".

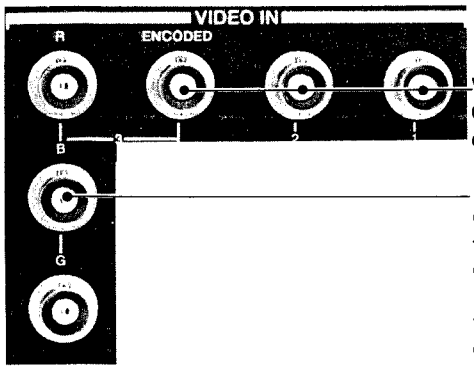
* To synchronize the VBS and R, G, B signals, it is necessary to delay the R, G and B signals. For details, see "TECHNICAL INFORMATION".

❷ CAMERA TALLY/INTERCOM connectors (DIN 4-pin)



Connect with the tally/intercom connector of a camera and a camera control unit.

❸ VIDEO IN connectors



VIDEO IN connectors 1, 2 and 3 (BNC type)
Connect the video signal (VBS) from a camera control unit or a time base corrector.

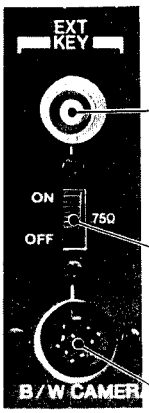
R, G and B connectors (BNC type)
Connect to a camera control unit of a 3-tube color video camera having the R, G and B output, such as the Sony DXC-M3/P/PM or DXC-6000/P/PM.
Connect the VIDEO IN 3 ENCODED connector and the VBS connector of the camera control unit, and the R, G and B connectors and the corresponding connectors on the camera control unit.
Both the ENCODED and R, G, B connectors should be connected to the camera control unit.

❹ VIDEO OUT connectors (BNC type)

Connect to the respective video input connectors of an SEG.
The video signals supplied to the VIDEO IN connectors are directly output from here, but are delayed in order to synchronize with the output signals from the CHROMA KEY OUT connectors.

❺ EXT KEY (external key) connectors and 75 Ω termination switch

Connect the external key input.



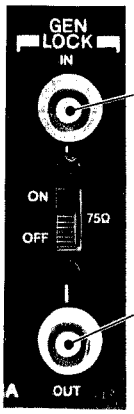
EXT KEY connector (BNC type)
Connect to the wipe output connector of the WEX-2000/P/PM wipe pattern extender.
As this connector is parallel to the B/W CAMERA connector, it is not possible to supply signals to both the EXT KEY and B/W CAMERA connectors, but you can monitor the signal supplied to the B/W CAMERA connector by connecting a monitor to the EXT KEY connector.

75 Ω termination switch
When a monitor is connected to the EXT KEY connector to check the picture of the monochrome video camera connected to the B/W CAMERA connector, set the switch to OFF. In this case, set the 75-ohm termination switch of the monitor to ON.
When either the B/W CAMERA or EXT KEY connector is used, set this switch to ON.

B/W CAMERA (black-and-white camera) connector (DIN 6-pin)
Connect to the video output of a monochrome video camera.
You can connect a Sony AVC-3000 series monochrome video camera having the video output/external sync connector directly to this connector using a CCF cable as the external sync signal is output from this connector.

Note: The EXT KEY and B/W CAMERA connectors cannot be used simultaneously.

❻ GEN LOCK (generator lock) connectors and 75 Ω termination switch



GEN LOCK IN connector (BNC type)
Connect the black burst or the VBS signal to synchronize this unit with the external sync signal.
All equipment connected to this unit will be then synchronized with this external sync signal.

GEN LOCK OUT connector and 75 Ω termination switch
The external sync signal connected to the above GEN LOCK IN connector is fed out from this connector (loop-through output).
When this connector is used, set the 75 Ω termination switch to OFF. Set the switch to ON when the GEN LOCK OUT connector is not being used.

❼ CHROMA KEY OUT connectors
(BNC type)

The chroma key signal is output from here. Connect to a monitor, VTR or an SEG.
The phase indicator pattern is added to the signal output from the CHROMA KEY OUT 2 connector when the PHASE INDICATION switch is set to ON. Use the CHROMA KEY OUT 2 connector for preadjustment and the OUT 1 connector for program.

❽ SEG TALLY/INTERCOM connector
(DIN 4-pin)

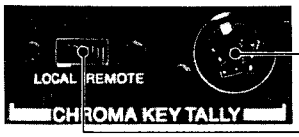
Connect to the tally/intercom connector of an SEG.
Communication between the SEG and a camera or a camera control unit connected to this unit is possible when the REMOTE/LOCAL switch on this unit is set to REMOTE. The tally lamp of the camera selected by the SEG will light up.

❾ ⏚ ground terminal

Connect to a good ground when required.

❿ CHROMA KEY TALLY section

When an SEG is used with this unit, select whether the tally signal is to be fed to the cameras from this unit or from the SEG.



CHROMA KEY TALLY connector (DIN 4-pin)
Connect to the tally/intercom connector of the SEG.

REMOTE/LOCAL selector
LOCAL: When using this unit without an SEG, set the selector to this position.
REMOTE: When using this unit with an SEG, set the selector to this position.

⓫ BLACK BURST OUT connectors
(BNC type)

Black burst (sync 0.3 V p-p, burst 0.3 V p-p) signals are output here to synchronize the cameras connected to this unit.
Connect to the gen lock input of a camera control unit.
The same black burst signal is output at each connector in parallel. The 1 to 3 connectors are independent of the VIDEO IN 1 to 3 connectors.

⓬ AC IN connector

Connect the supplied ac power cord here.

⓭ Voltage selector [Except CRK-2000]

Set to your local power supply voltage.

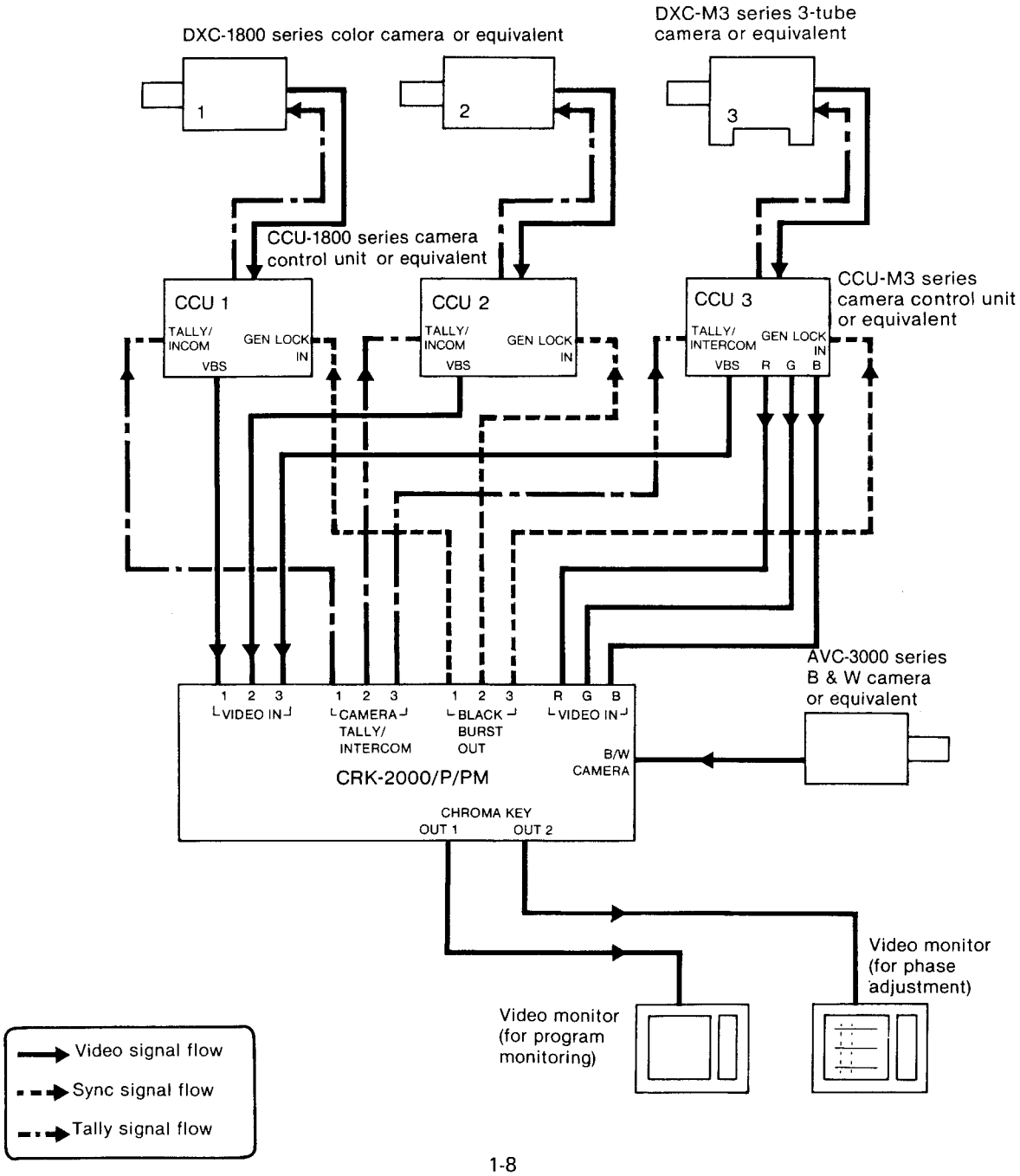
1-3. SYSTEM EXAMPLES AND CONNECTIONS

Three color video cameras are connected via appropriate camera control units as program sources in the following examples, while you may use a VTR with a time base corrector in place of one camera.
We recommend that a 3-tube camera such as the Sony DXC-M3/P/PM be connected to the VIDEO IN 3 (ENCODED, R, G, B) inputs and be used for the "key picture" source in the chroma key.

It may also be possible to connect cameras without using the camera control units. Refer to the instructions of the equipment to be connected.
The power connection must be made last, with the POWER switch set to OFF.

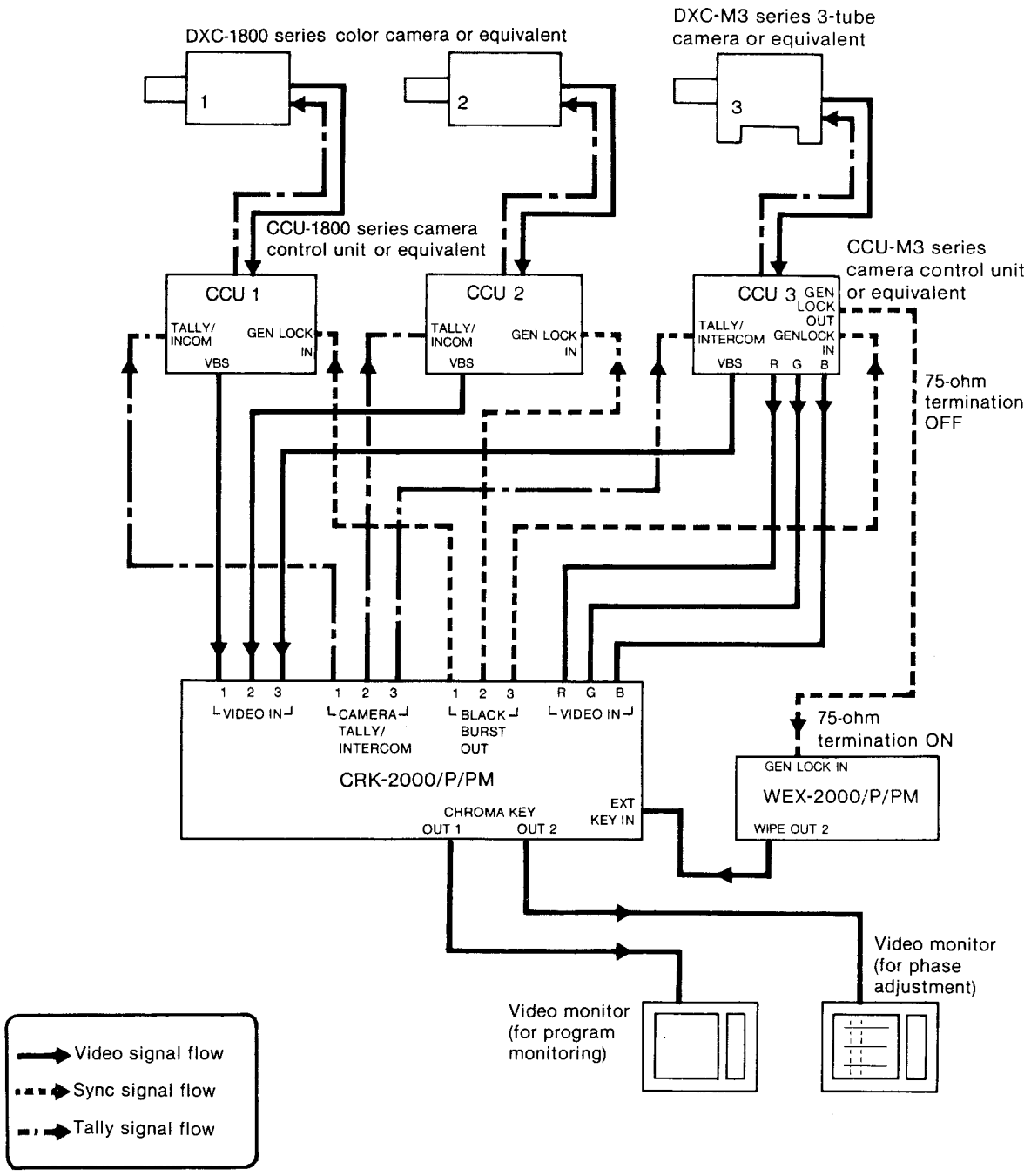
1-3-1. Example 1 – Basic system

Any two of the three camera inputs can be combined in the chroma key operation, external keying of letters and figures is possible when a B & W camera is used.



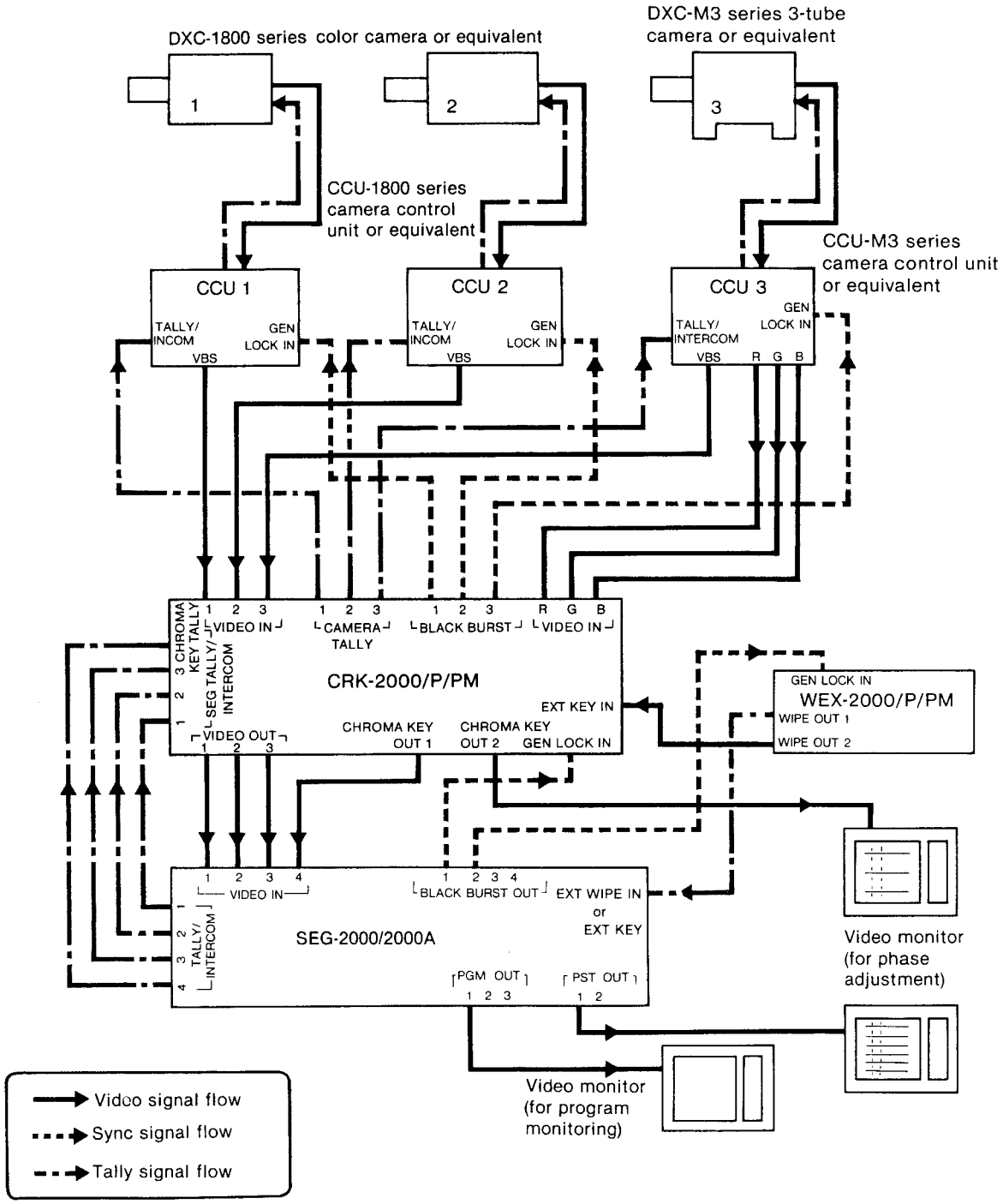
1-3-2. Example 2 – System with WEX-2000

Substituting for the B & W camera in the example 1, the Sony WEX-2000/P/PM wipe pattern extender supplies wipe pattern signals as external key signals enabling the wipe operation.



1-3-3. Example 3 – Full System with SEG-2000 Series

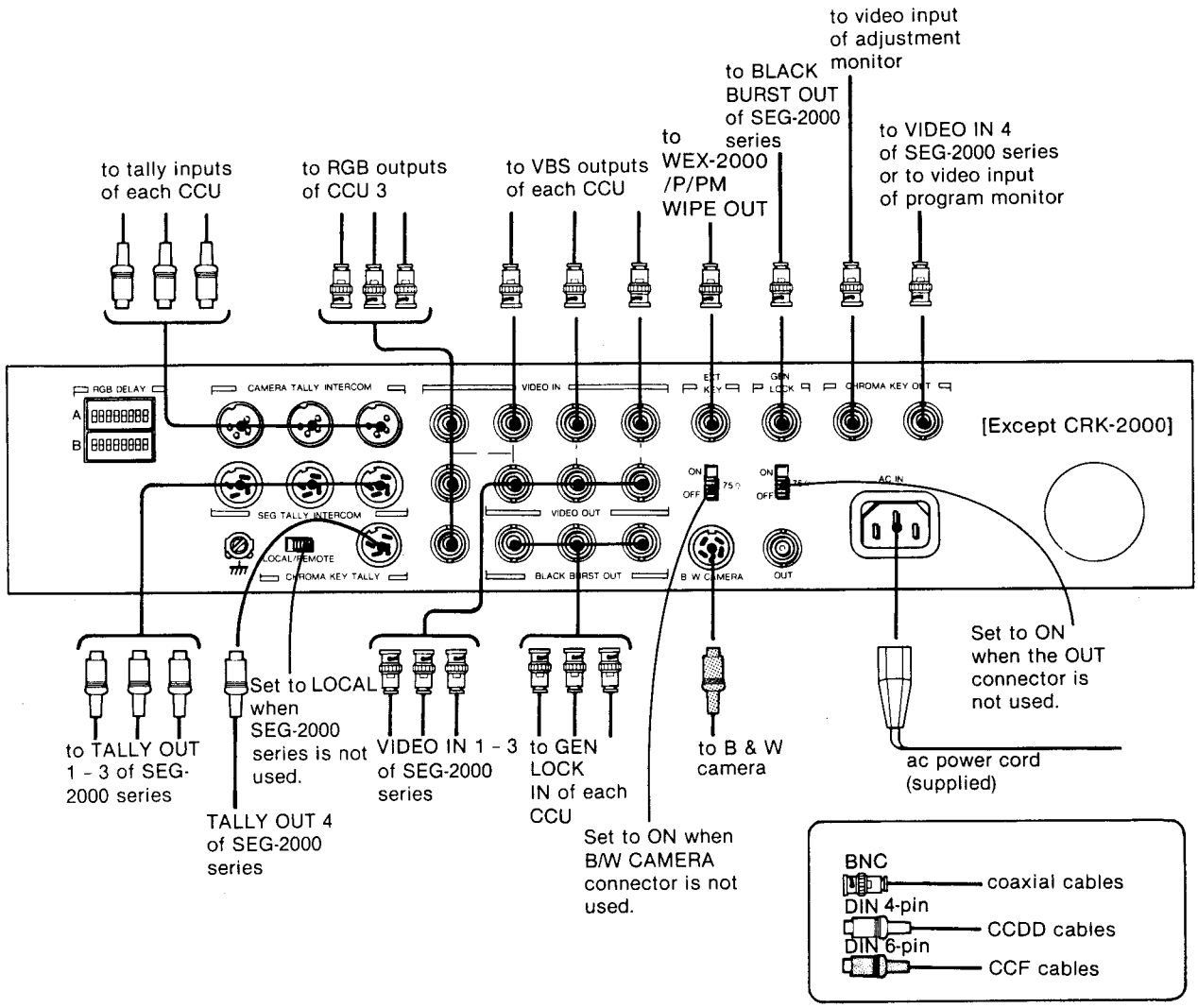
A full special effect capability including double-wiping, is provided by using a Sony SEG-2000 series special-effects generator as the system console.



Caution

Use only coaxial cables with the same length to connect the CRK-2000/P/PM VIDEO OUT 1 – 3/CHROMA KEY OUT and the SEG-2000 series unit's VIDEO IN 1 – 4 connectors. A difference in length of more than 5 cm may cause ±2% color phase lag.

1-3-4. Connections


to video input of adjustment monitor
to BLACK BURST OUT of SEG-2000 series
to WEX-2000 /P/PM WIPE OUT
to VIDEO IN 4 of SEG-2000 series or to video input of program monitor
to tally inputs of each CCU
to RGB outputs of CCU 3
to VBS outputs of each CCU
RGB DELAY
CAMERA TALLY INTERCOM
VIDEO IN
ECT KEY
GEN LOCK
CHROMA KEY OUT
[Except CRK-2000]
SEG TALLY INTERCOM
VIDEO OUT
LOCAL/REMOTE
CHROMA KEY TALLY
BLACK BURST OUT
B W CAMERA
OUT
AC IN
ON
OFF
Set to ON when the OUT connector is not used.
to TALLY OUT 1 - 3 of SEG-2000 series
Set to LOCAL when SEG-2000 series is not used.
TALLY OUT 4 of SEG-2000 series
VIDEO IN 1 - 3 of SEG-2000 series
to GEN LOCK IN of each CCU
Set to ON when B/W CAMERA connector is not used.
to B & W camera
ac power cord (supplied)
BNC
coaxial cables
DIN 4-pin
CCDD cables
DIN 6-pin
CCF cables

1-4. SET-UP

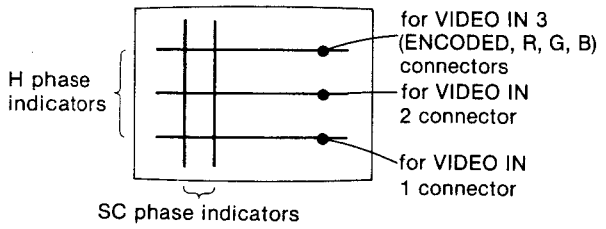
Prior to use, turn on the system units and perform the following preadjustments.

1-4-1. Phase Adjustments

First, adjust the phase between the cameras and the CRK-2000/P/PM.

Note: Even when the SEG-2000 series unit is connected (system example 3), the cameras and the CRK-2000/P/PM must be adjusted in advance.

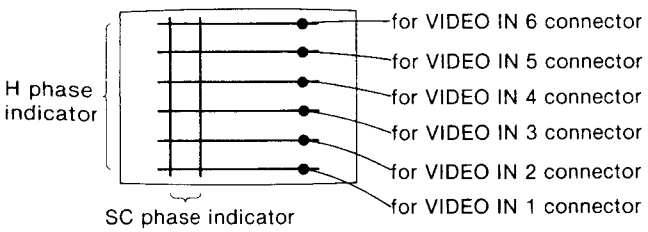
1. Adjust the camera control units (CCU) so that they output color bar signals to the CRK-2000/P/PM.
2. Set the MODE selector to LINE SEL and the CAMERA PHASE INDICATION switch to ON on the CRK-2000/P/PM.
   The phase check pattern will appear on the monitor connected to the CHROMA KEY OUT 2 connector.


H phase indicators
for VIDEO IN 3 (ENCODED, R, G, B) connectors
for VIDEO IN 2 connector
for VIDEO IN 1 connector
SC phase indicators

3. Push the LINE 1 button of the KEY bus selectors to select the signal from the CCU connected to the VIDEO IN 1 connector.
4. Turn the H phase control on the selected CCU so that the H phase indicator for the VIDEO IN 1 connector appears on the monitor screen.
5. Turn the SC phase control on the CCU so that the two SC phase indicators on the monitor screen are as close as possible.
6. Switch the KEY bus selectors and adjust the phases of the second and third CCU in the same manner.
   ● Be sure to adjust the H phase first, then the SC phase.
7. Reset the CAMERA PHASE INDICATION switch of the CRK-2000/P/PM to OFF.

Then, adjust the phases between the CRK-2000/P/PM and the SEG-2000 series unit, if connected.

1. Set the PGM/PST switch to PGM and the PHASE INDICATION switch to ON on the SEG-2000 series unit.
   The phase indicator pattern will appear on the monitor connected to the PST OUT connector of the SEG-2000 series unit.


H phase indicator
for VIDEO IN 6 connector
for VIDEO IN 5 connector
for VIDEO IN 4 connector
for VIDEO IN 3 connector
for VIDEO IN 2 connector
for VIDEO IN 1 connector
SC phase indicator

2. Press the PST bus line button of the SEG corresponding to the VIDEO IN connector to which the CRK-2000/P/PM is connected. ("4" in the system example 3 on page 12).
3. Turn the H PHASE control screw on the CRK-2000/P/PM so that the H PHASE indictor for the selected VIDEO IN connector appears on the monitor screen.
4. Adjust the SC PHASE switch and control screw on the CRK-2000/P/PM so that the two SC phase indicators on the monitor screen are as close as possible.
5. Reset the PHASE INDICATION switch of the SEG-2000 series unit to OFF.

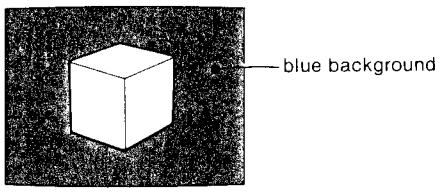
When the above phase adjustments are completed, adjust the video monitor's hue by observing the color bars so that the same color is obtained on all video monitors.

Note:
It may take about 30 - 60 minutes after the power is turned on until the hue of a camera having the GEN LOCK function is stabilized.
When the phase adjustments are performed just after the power is turned on, readjustment after rehearsal is strongly recommended.

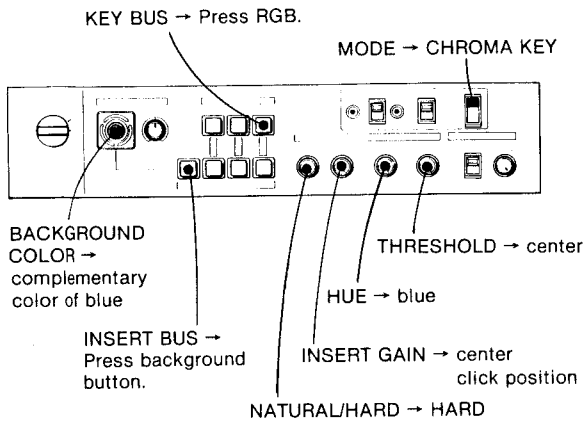
1-4-2. RGB Delay Adjustments

Because the separate RGB inputs at the VIDEO IN 3 connectors precede the ENCODED input while the VBS signal is encoded in the camera, an RGB delay circuit is provided in the CRK-2000/P/PM to synchronize the RGB signals with the VBS signal. Adjust the appropriate delay time as follows. Though this unit has been adjusted at the factory for the DXC-M3 series cameras, it may be necessary to readjust the RGB delay time.

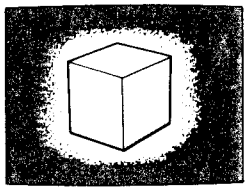
1. Adjust the white balance and the black balance of the camera referring to the camera's instruction manual.
2. Point the camera at an object having vertical sharp lines in front of an evenly lighted blue background (use the supplied chroma key cloth).



3. Set the CRK-2000 switches and controls as follows.

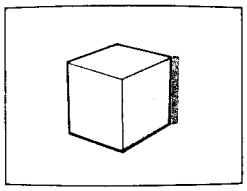

KEY BUS → Press RGB.
MODE → CHROMA KEY
BACKGROUND COLOR → complementary color of blue
THRESHOLD → center
HUE → blue
INSERT BUS → Press background button.
INSERT GAIN → center click position
NATURAL/HARD → HARD

4. While observing the monitor screen, turn the THRESHOLD control so that the color set at the BACKGROUND COLOR joystick appears in the blue area.
5. Turn the HUE control to diminish the blue area.



6. Turn the THRESHOLD control to expand the area of the color set by the BACKGROUND COLOR joystick.

Repeat steps 5 and 6 until the background area is completely covered with the color set by the BACKGROUND COLOR joystick.
The lag of the VBS signal will cause incomplete keying at the edge of the object.



The blue background remains at the edge.

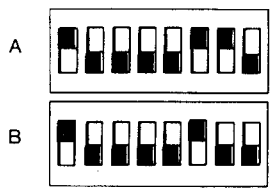
7. Set the RGB signal delay time at the DIP switches on the connector panel.
The appropriate delay time depends on the camera connected. Observing the monitor screen, change the switch settings by 40 or 50 nsec as shown in the following table for best results.

(○ ON)

Switches / RGB/VBS	A								B							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
0 (nsec)								○	○		○					
40						○	○		○		○					
80				○	○		○		○		○					
120		○	○		○		○		○		○					
160				○	○		○					○			○	
200		○	○		○		○					○			○	
250								○	○	○					○	
290						○	○		○	○					○	
330				○	○		○		○	○					○	
370		○	○		○		○		○	○					○	
410	○			○	○		○									○
450	○	○	○		○		○									○
500	○							○	○					○		
540*1	○					○	○		○					○		
580	○			○	○		○		○					○		
620	○	○	○		○		○		○					○		
660	○			○	○		○					○	○			
700	○	○	○		○		○					○	○			
750	○							○	○	○			○			
790*2	○					○	○		○	○			○			
830	○			○	○		○		○	○			○			
870	○	○	○		○		○		○	○			○			

*1 Shows the reference level for the DXC-M3 and *2 for the DXC-6000.

Example: Reference level for the DXC-M3 (540 nsec)



1-5. OPERATION

After rehearsal, readjust the phase between the cameras and this unit, and between this unit and the SEG.

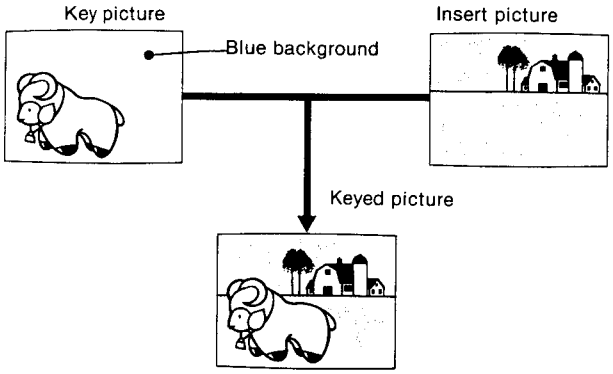
1-5-1. Swiching

The signals from the VIDEO IN connectors 1 to 3 are output from the CHROMA KEY OUT connector without any special effects. You can switch these signals and check the picture.

1. Set the MODE selector to LINE SEL.
2. Select the picture by using the LINE 1, 2 and the 3 (RGB) button of the KEY BUS.

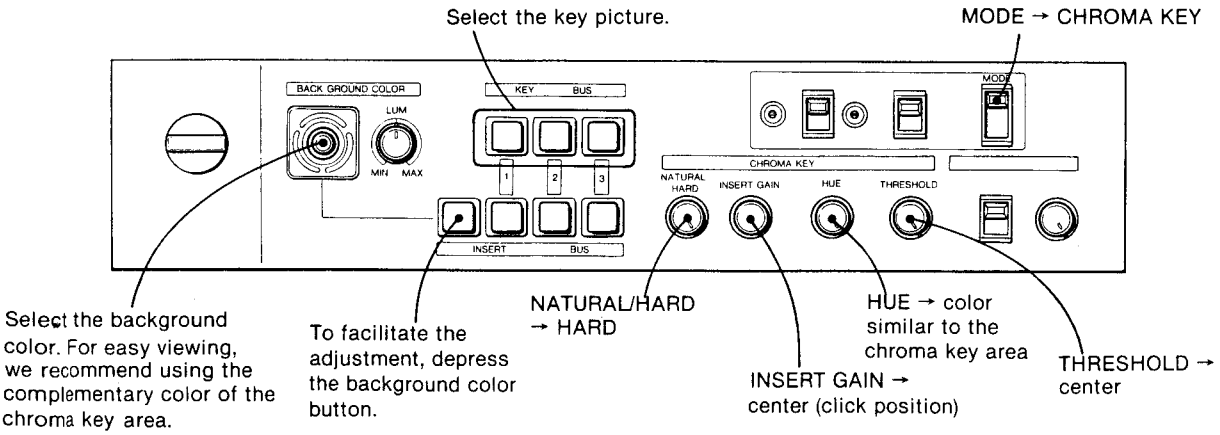
1-5-2. Chroma Key

By using the chroma key process, you can cut out a specific color portion (chroma key area) from one picture and fill the other picture in that portion.
We call the picture from which the specific color portion is to be extracted the "key picture" and the picture to be fitted in the "insert picture".



Chroma key area
Any color can be designated for the chroma key area, but the color most often used for keying live subjects is blue. This is because skin tones contain virtually no blue, and are thus reproduced without distortion during the chroma key operation.
We recommend using the supplied chroma key cloth or a cloth of a similar color and material for the chroma key background in order to make the most of the natural effect of this unit explained later.

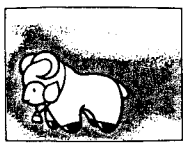
Preparation



Operation

1

Turn the CHROMA KEY HUE control so that the background color covers the chroma key area.

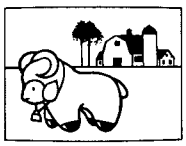
2 

Turn the THRESHOLD control so that the background color thins out.

3 Turn the HUE control again so that as much of the chroma key area as possible is covered by the background color.

4

Turn the HUE control and the THRESHOLD control alternately so that the entire chroma key area is covered by the background color.

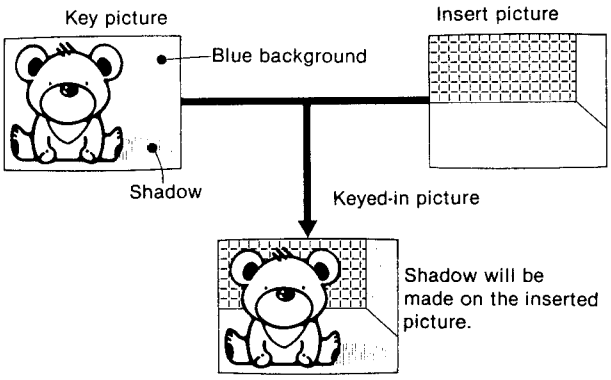
5 

Select the insert picture by pressing one of the INSERT bus buttons. The background color will be replaced by the insert picture.

Natural effect

By reflecting the shading of the chroma key area on the insert picture, the rugged surface of the key picture such as the creases of the clothes, shadows or a transparent object like a glass, can be keyed in.

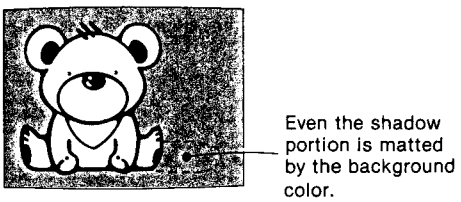
Example: Shadow



To obtain the natural effect, turn the NATURAL/HARD control toward the NATURAL position after the chroma key operation step 5, so that the inserted picture is shaded naturally.

Notes

- During the chroma key matting, adjust the CHROMA KEY HUE control and THRESHOLD control so that even the shadow to be keyed is matted by the background color.

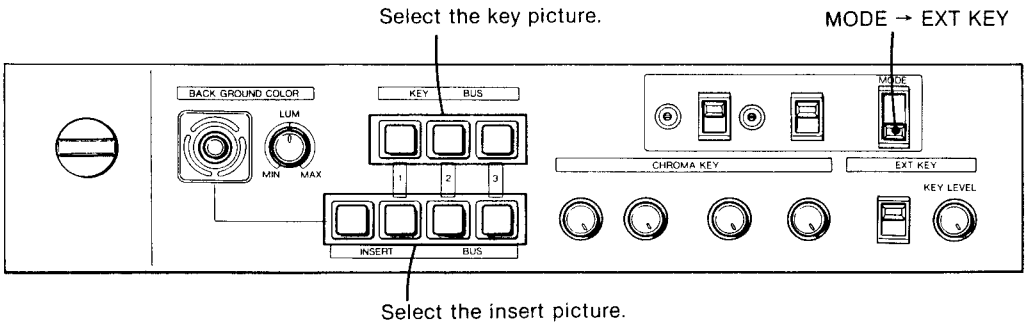


- If the luminance of the inserted picture becomes too low because of the low-luminance of the key picture when the NATURAL/HARD control is used, turn the INSERT GAIN control toward the + position to brighten the inserted picture.
- A too deep or too faint shadow or creases may cause unsatisfactory chroma key matting. Adjust the lighting so that the shading of the chroma key area is sufficient.

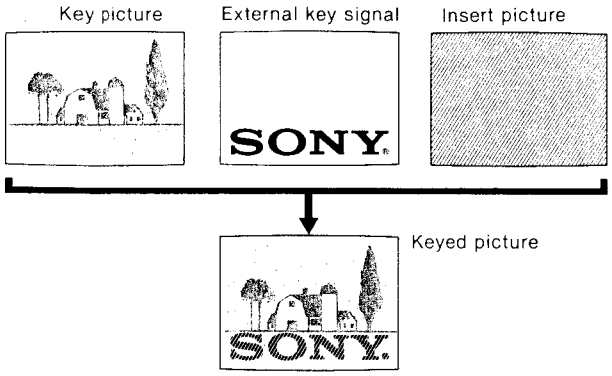
1-5-3. External Key

You can cut out the characters and figures from the key picture and put the insert picture in that portion.
Using the optional WEX-2000/P/PM wipe pattern extender, it is possible to wipe the key picture and insert picture.

Preparation



When using a picture from a black-and-white camera as an external key



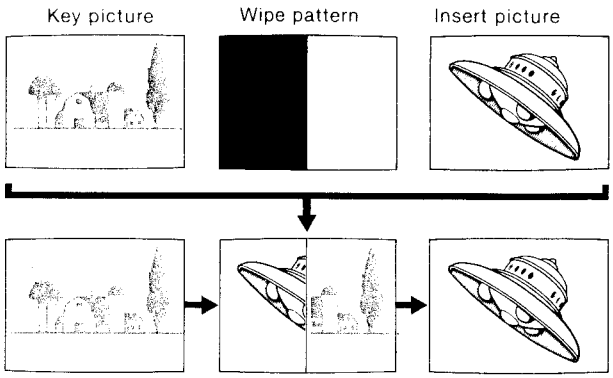
It is possible to superimpose characters shot by a black-and-white camera over the key picture, or to put the insert picture into the key picture where a figure shot by a black-and-white camera has been cut out. (System example 1)

Operation

1. Set the EXT KEY NORMAL/INVERT selector as follows.
   NORMAL: To cut out the black portion
   INVERT: To cut out the white portion
2. Turn the KEY LEVEL control so that the characters or figures to be inserted are cleav.
3. When selecting the background color as insert picture, adjust the background color hue and brightness with the BACKGROUND COLOR joystick and LUM control.

When using a wipe pattern from the WEX-2000/P/PM wipe pattern extender as an external key

Key picture and insert picture can be wiped using the wipe pattern from the WEX-2000/P/PM. (System example 2)

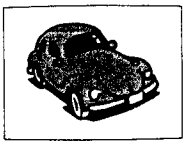


Operation

1. Set the EXT KEY NORMAL/INVERT selector to te appropriate position.
2. Set the KEY LEVEL control to the center position.
3. Select the wipe pattern on the WEX-2000/P/PM.
4. Execute wiping on the WEX-2000/P/PM.
   The key picture and the insert picture are wiped.

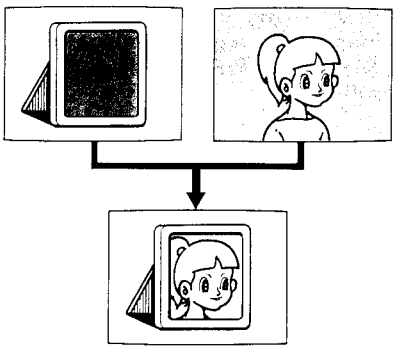
1-6. ADVANCED OPERATION OF CHROMA KEY

<Basic operation example 1>
Coloring the subject



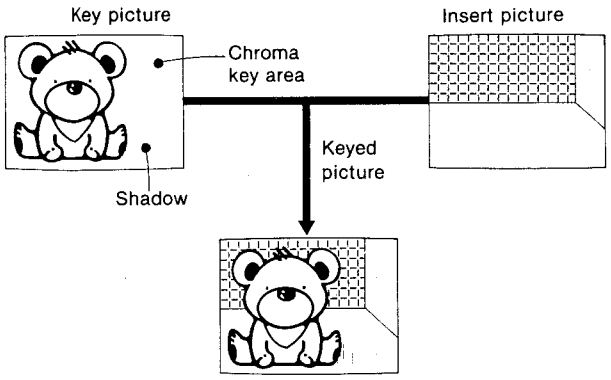
Coloring the car any color
(with background color)

<Basic operation example 2>
Setting a person or a picture in a frame



These two examples are the most basic operations of the chroma key. By making good use of the natural effect of this unit, you can create effective chroma key pictures with a three-dimensional feeling and a feeling of the various materials in the pictures.

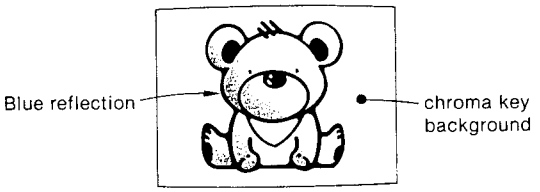
<Application example 1 : Shadow>
Key-inserting a person or an object with its shadow will give the keyed picture perspective.
Equipment used :
Key camera (3-tube, RGB camera, for example, the DXC-M3/P/PM) for shooting an object or a person with its shadow
Insert camera (DXC-1800/P/PM, etc.) for shooting background scene
CRK-2000/P/PM



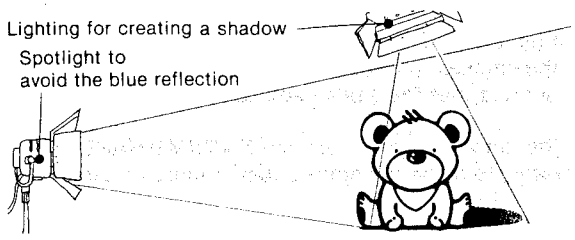
Adjust the framing of the insert picture.

After the chroma keying, adjust the NATURAL/HARD control so that the shadow appears.

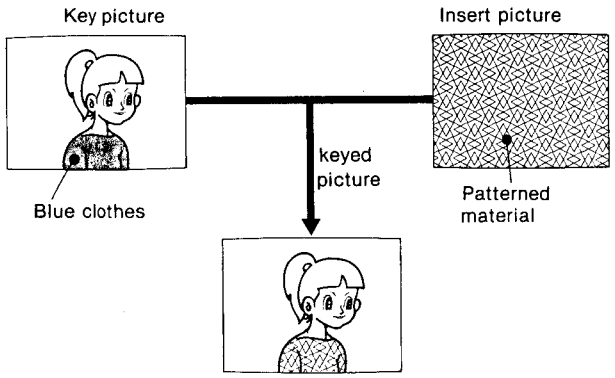
A tip!
Lighting is the key to an effective chroma key process. When shooting the subject of the key picture with the chroma key background, avoid letting the chroma key background reflect blue light on the edges of the subject, as this will cause noisy or ragged keying in those areas.



When keying under this condition, spotlight the subject from the side to avoid reflection of blue and make the subject cast a shadow by lighting the subject from above and adjusting the shadow.



<Application example 2 : Changing clothes>
Here is a variation on the basic operation, example 2. Instead of changing the color of the subject by inserting a background color, let's change the pattern of the clothes on a subject.
Equipment used :
Key camera (3-tube, RGB camera, for example, the DXC-M3/P/PM) for shooting a person in blue clothes
Insert camera (DXC-1800/P/PM, etc.) for material with a pattern CRK-2000/P/PM.



After the chroma keying, adjust the NATURAL/HARD control so that the creases of clothes appear with natural shading.

A tip!
To make the creases appear with natural shading, emphasize the creases by lighting the subject intensely from above.

<Application example 3 : Smoke>
Let's try to key-insert a wisp of smoke from a cigarette.
Key-inserting smoke is a difficult task without a very good camera and elaborate lighting.

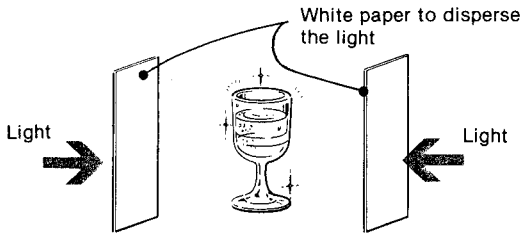
Equipment used :
Key camera (3-tube, RGB camera, for example, the DXC-M3/P/PM) for shooting a smoke of cigarette.
Insert camera (DXC-6000/P/PM, etc.)
CRK-2000/P/PM

Key to lighting the smoke
Light the smoke so that the brightness of the smoke is emphasized and that the smoke appears as white.

After the chroma keying, turn the NATURAL/HARD control moderately to make the smoke appear more natural.

<Application example 4 : A glass>
Keying a glass is as difficult task as keying smoke.
Glass passes through the chroma key background color and tends to drop out the glass itself with the background during chroma key process.
To key-insert a glass, position the lighting so that the variations in the lighting on the glass are emphasized.

Lighting of the glass
Light the glass so that the edges of the glass are emphasized.

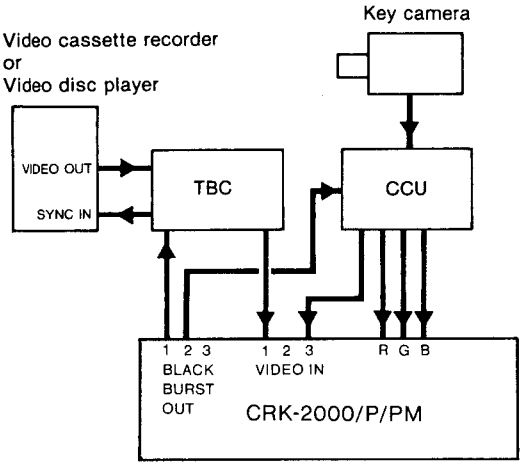


A tip!
For effective keying, bring the glass into focus and shoot the background out of focus.

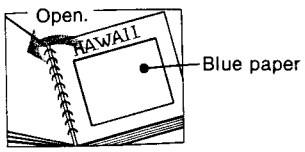
Now that you know some examples of the natural effect, shoot a variety of materials and try to make the most of the natural effect of this unit.

The next step is to learn the more complicated chroma key operations made possible by adding equipment to the cameras and this unit.

<Application example 5: Key-inserting the picture from a VTR or a video disc player>
On the first page of an album titled "Remembrance in Hawaii", a scene in Hawaii shot by a video camera instead of a photo appears...
Such an effect can be obtained by entering the video signal from a video cassette recorder (a Sony VO-5000 series recorder) or a video disc player (Sony LDP-1000, etc.) via a time base corrector (TBC).

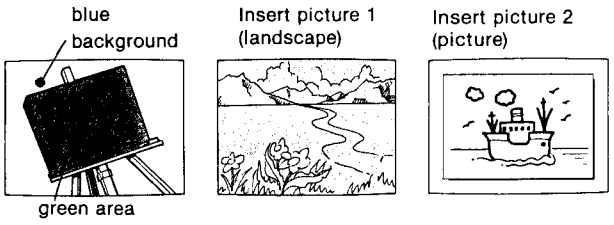


Chroma key operation
Shoot an album such as that illustrated below with the key camera. For the insert picture, select a video signal from a video cassette recorder or a video disc player.



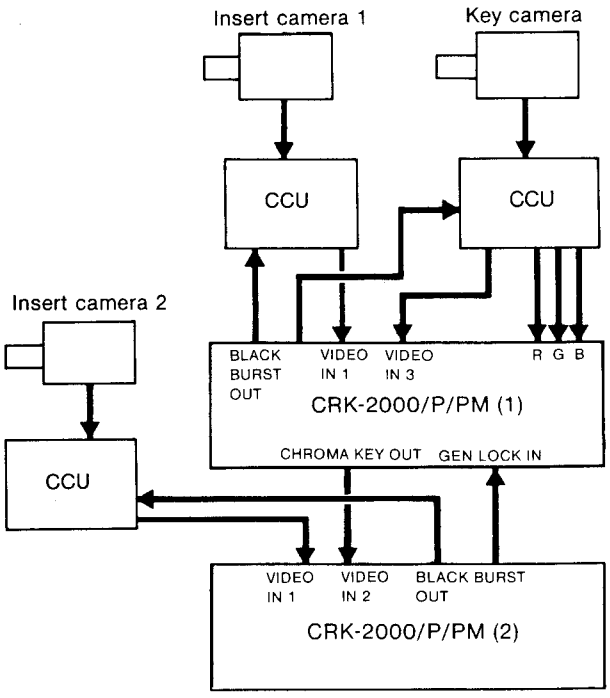
<Application example 6 : Double chroma key>
Because any color can be selected as the chroma key color, chroma key operation on two colors can be executed by using two CRK-2000/P/PM chroma keyers.
For example, key-insert into a picture of a person painting a picture on an easel both the background and the picture being painted.

Key picture



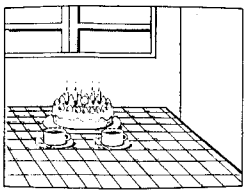
For the colors of the chroma key areas, if you select blue for one color, select the complementary color, green, for the other color. In this case, be careful that the insert picture 1 (landscape) does not contain green, since, if it does, that green portion will be dropped in the second chroma key process.

Connection

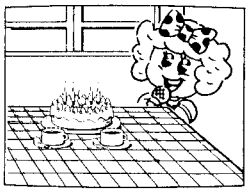


<Application example 7: Key-inserting persons into a photo>

Insert picture



Key-inserted picture



The insert camera is shooting a photo.

Construct a table just as it is in the photo and cover the table with a blue cloth. Set the table against a blue background and have your subjects sit down. Shoot this scene with the key camera and adjust the camera angle so that the persons are put at the table in the photo.

1-7. TECHNICAL INFORMATION AND BLOCK DIAGRAM

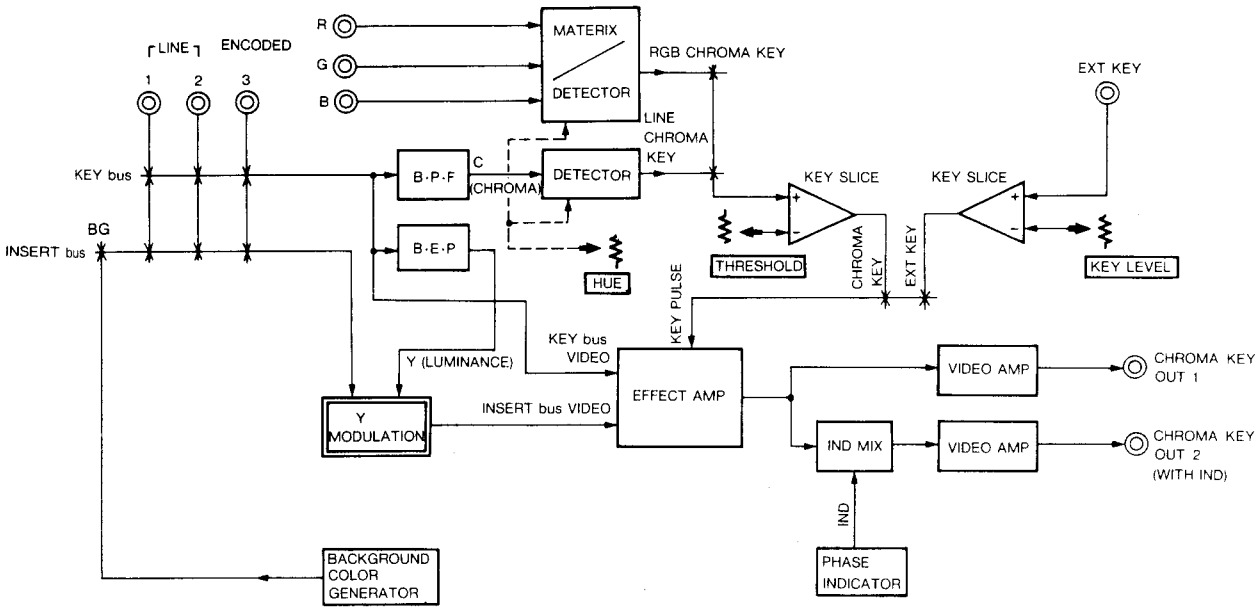
RGB CHROMA KEY

In the chroma key operation, a color having the same hue level as that set at the HUE control is electrically erased from the chroma of the "key picture".
The chroma key using RGB color signals to find the color to be keyed out is called "RGB chroma key", while "line chroma key" uses VBS composite video signals.
Compared with VBS signals, RGB signals contain the chroma in a wider frequency range. This enables more presice keying in the specified color area when RGB signals are supplied from the "key picture" source.
The "RGB chroma key" is possible with the CRK-2000/P/PM by connecting a 3-tube camera to the VIDEO IN 3 (ENCODED, R, G, B) inputs as the "key picture" source.
The CRK-2000/P/PM provides a keying band width of about 0.8 MHz in the "line chroma key" and of about 2 MHz in the "RGB chroma key".

RGB DELAY

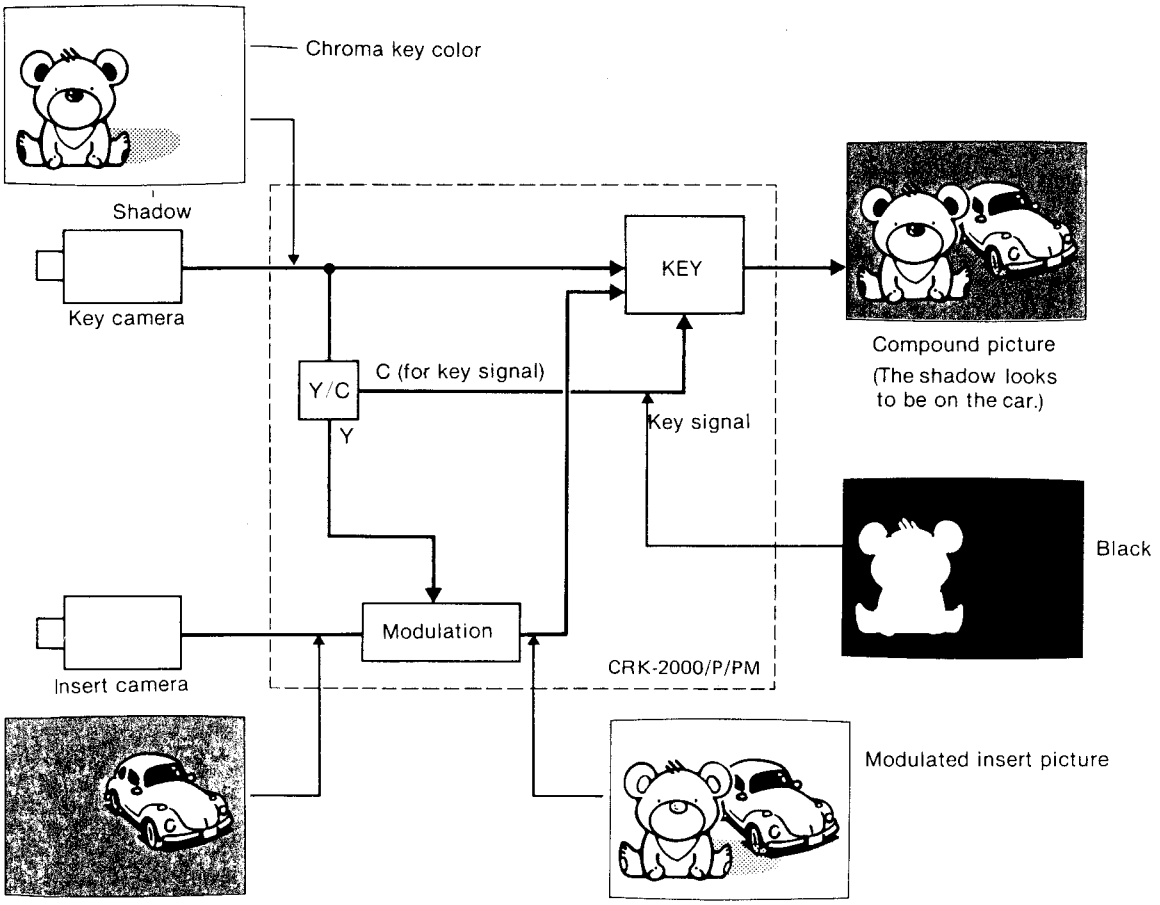
When using a 3-tube camera, RGB signals can be directly obtained from the respective pick-up tubes, while VBS signals are processed in the encode circuit of the camera. This causes a time lag of VBS signals.
Remember that the color to be keyed out is defined by the RGB signals, and the object to be left is displayed by the encoded VBS signals in the "RGB chroma key". If the above time lag is neglected, it obviously causes imcomplete keying at the edge of the object.
The delay circuit is provided in the CRK-2000/P/PM in order to prevent this problem by delaying the RGB signals to match the VBS signals. The delay time can be adjusted from 0 to 870 nsec in 40 or 50 nsec steps according to the camera to be used.

BLOCK DIAGRAM



NATURAL CHROMA KEY

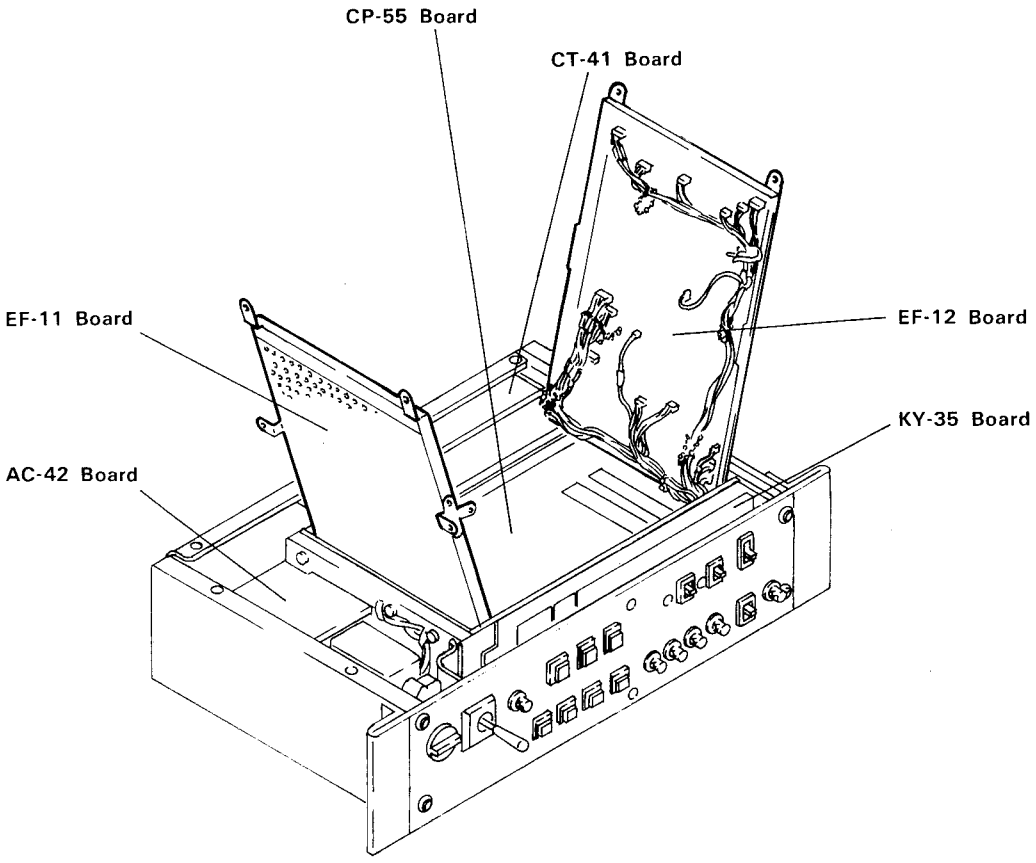
The natural chroma key of the CRK-2000/P/PM which creates natural shadow on the composed picture differs from the conventional soft chroma key in the procedure.
As shown in the diagram below, the luminance signal is picked up from the VBS signals of the "key picture". This luminance signal is sent to the modulation circuit and accordingly modulates the "insert picture". The modulation level is decided by the NATURAL/HARD control on the panel. The further the control is turned from HARD (modulation level "0"), the higher the modulation level becomes. The, luminance level as well as chroma level will be lowered at the parts of the "insert picture" corresponding to the parts of the dark parts (low luminance area) of the "key picture". Thus, the shadow of the subject in the "key picture" falls on the "insert picture".



For sufficient key-out in chroma key operation, use those colors which have high luminance level as well as high chroma level. The blue of the supplied chroma key cloth will provide the best results.
If a color having a low luminance level is used, the variation of luminance level in the area to be keyed out will be too little and the whole insert picture will be too much darkened to create shadows.

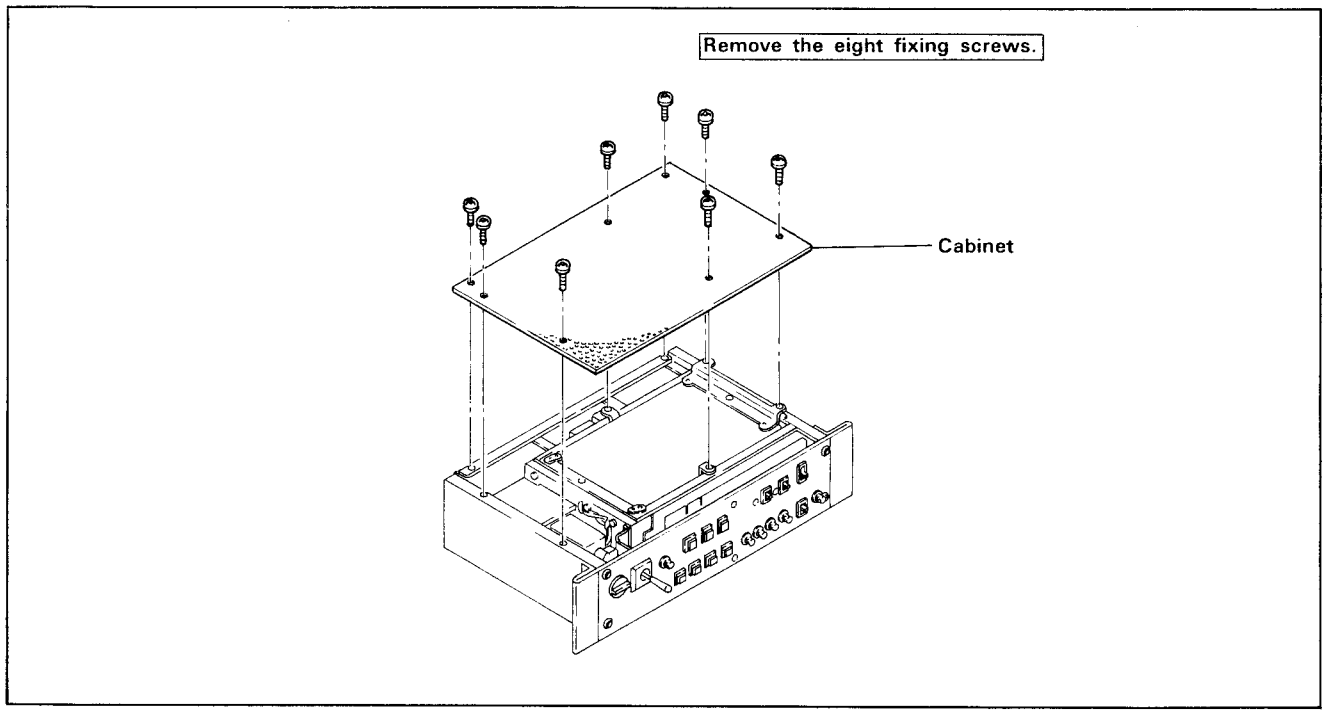
SECTION 2
SERVICE INFORMATION

2-1. LOCATION OF MAIN PARTS

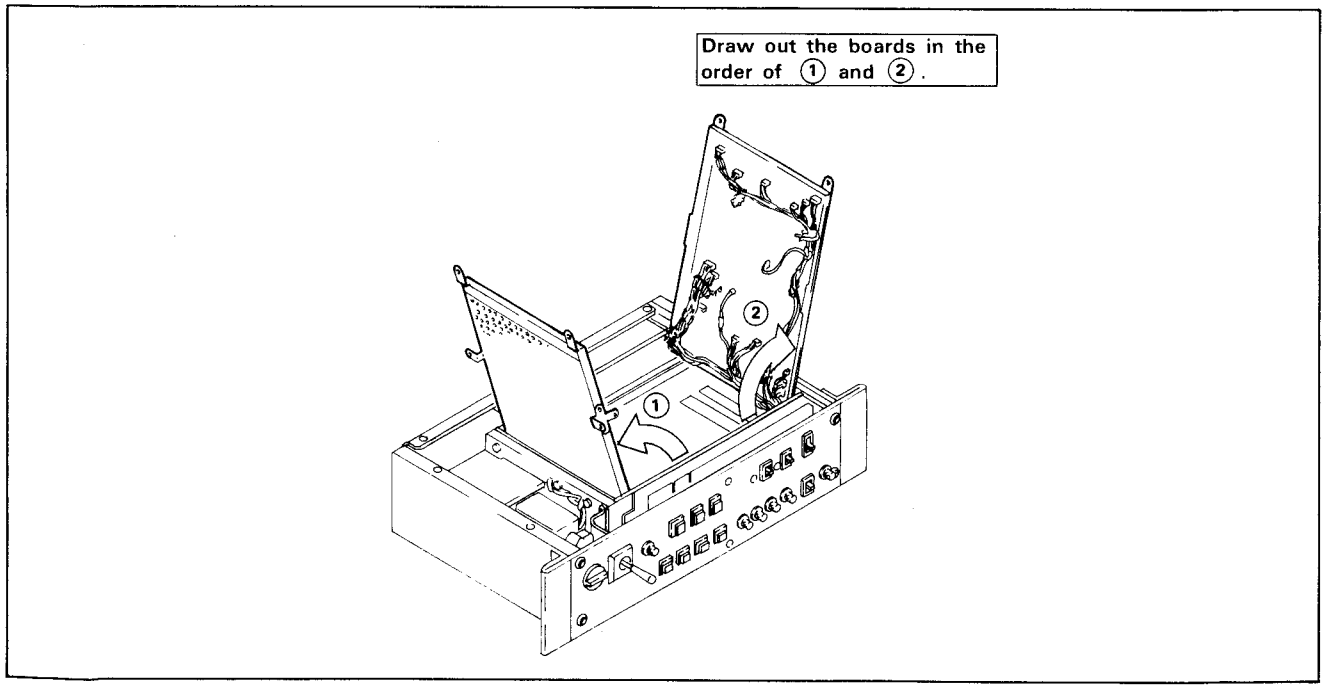


2-2. NOTES ON SERVICING

2-2-1. Removal of Cabinet

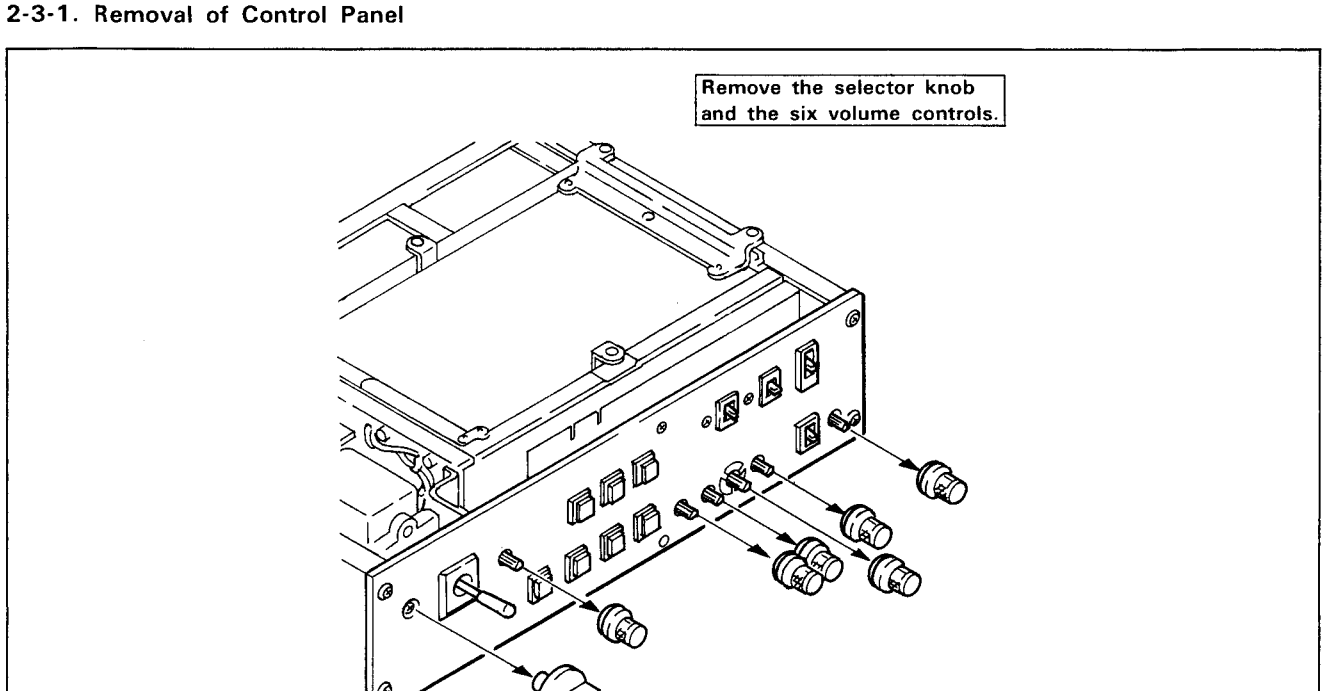


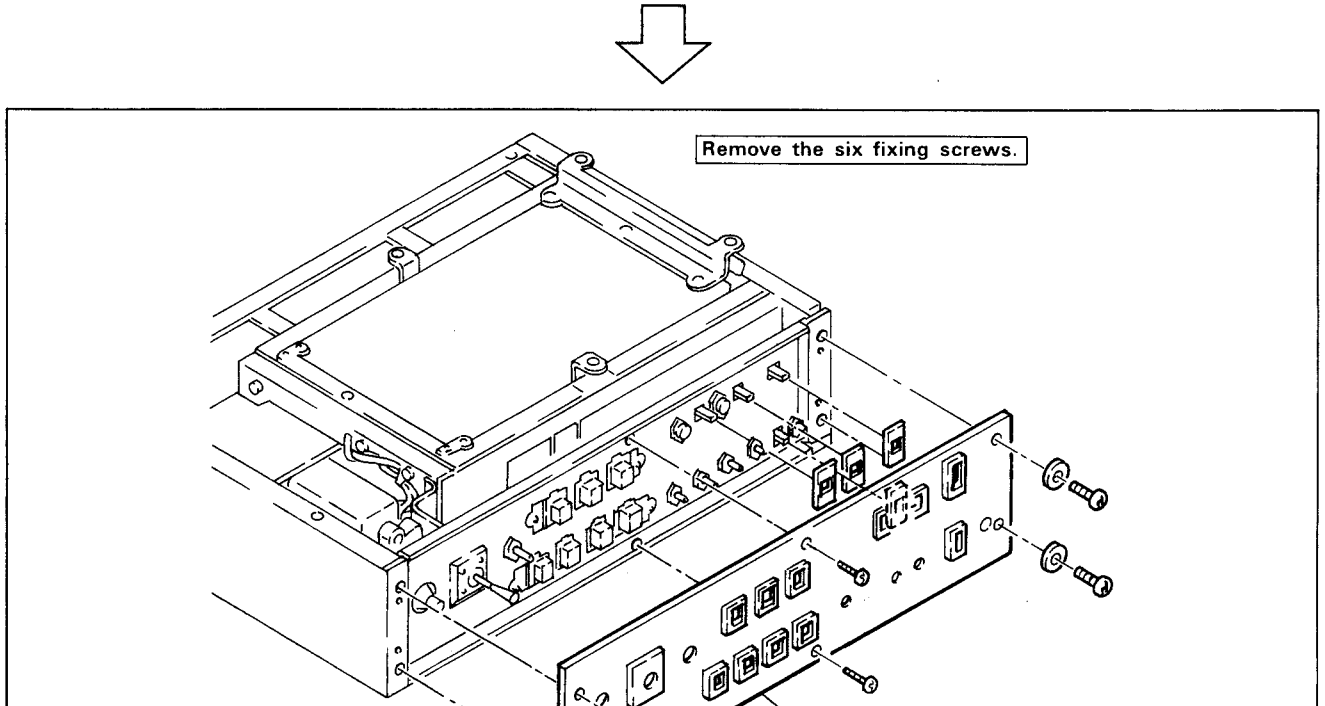
2-2-2. Opening the EF-11 Board and the EF-12 Board



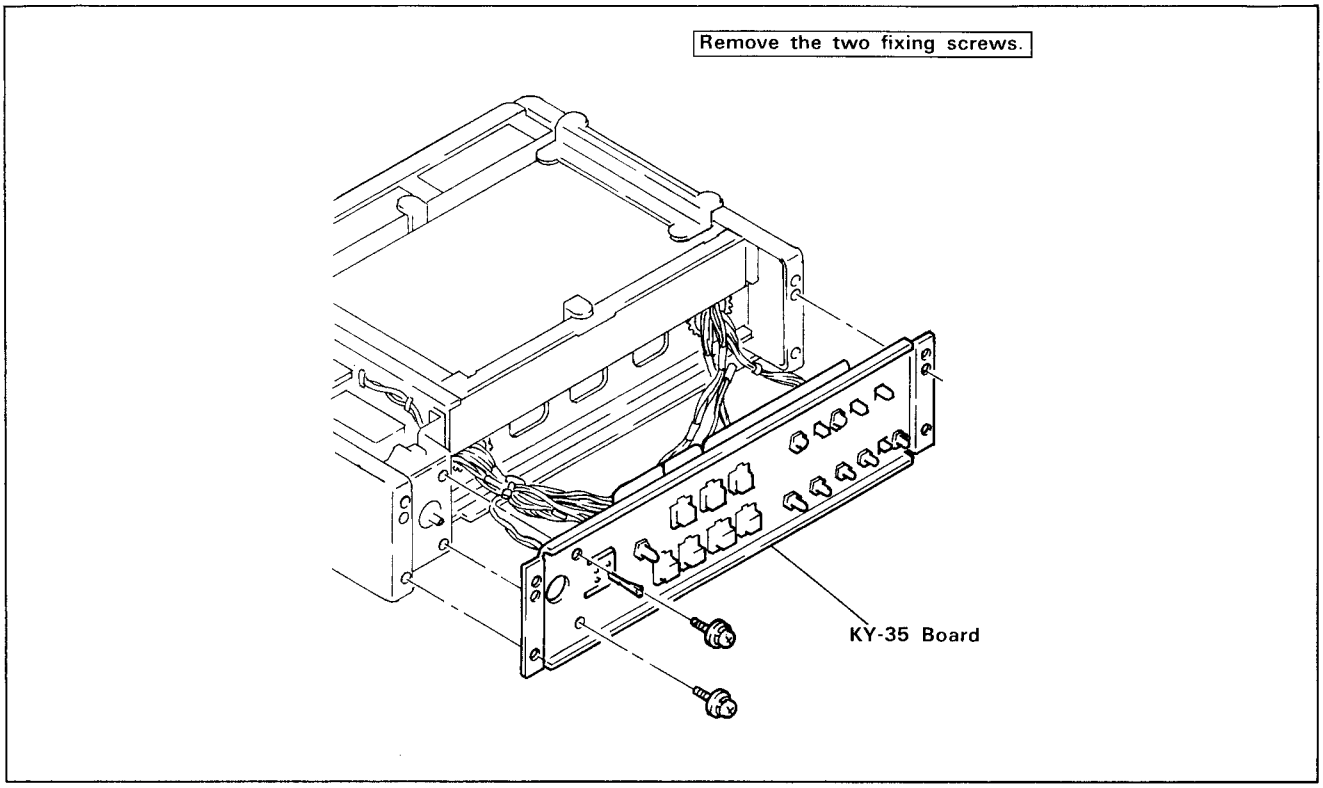
2-3. REMOVAL OF CABINET AND BOARD

2-3-1. Removal of Control Panel

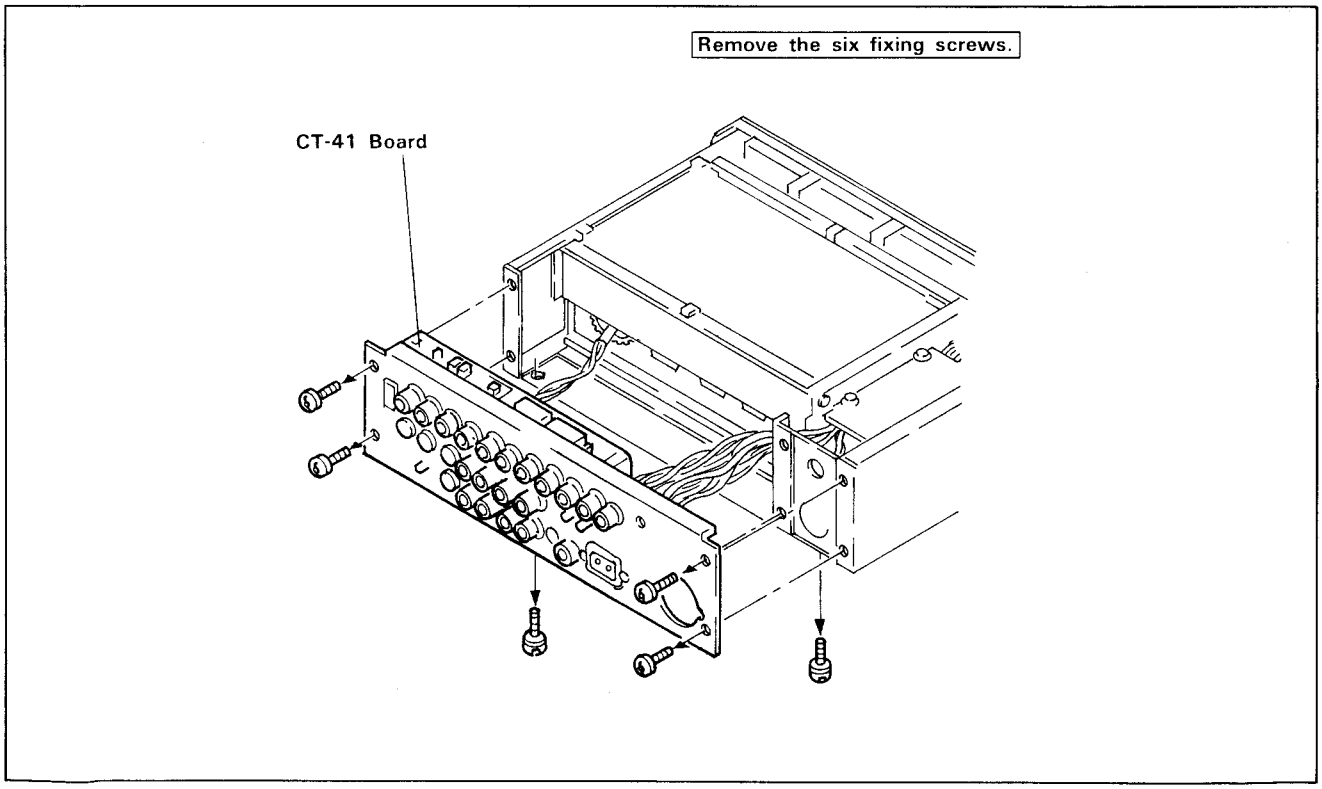




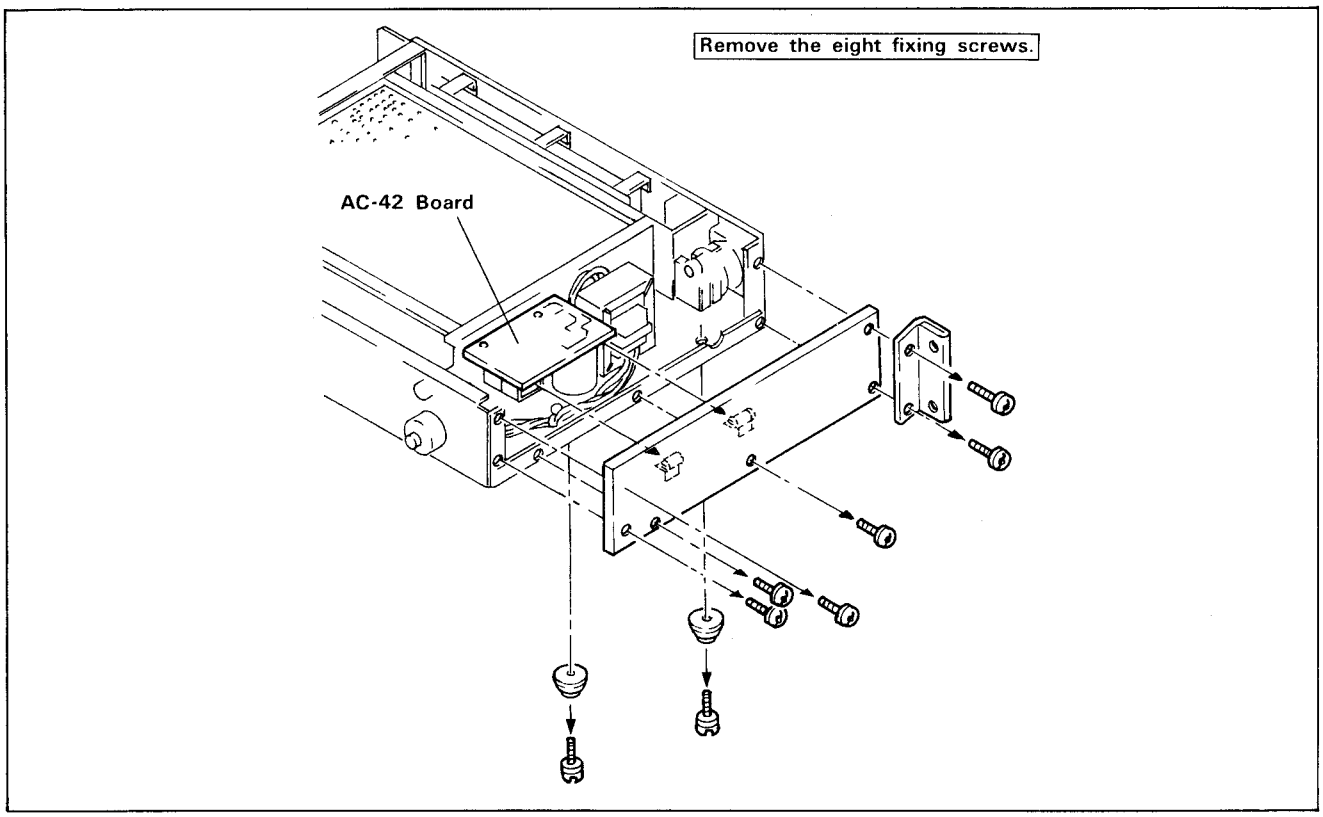
2-3-2. Removal of KY-35 Board



2-3-3. Removal of Connector Panel



2-3-4. Removal of Side Panel



SECTION 3
POWER SUPPLY ADJUSTMENT

[Instrument]

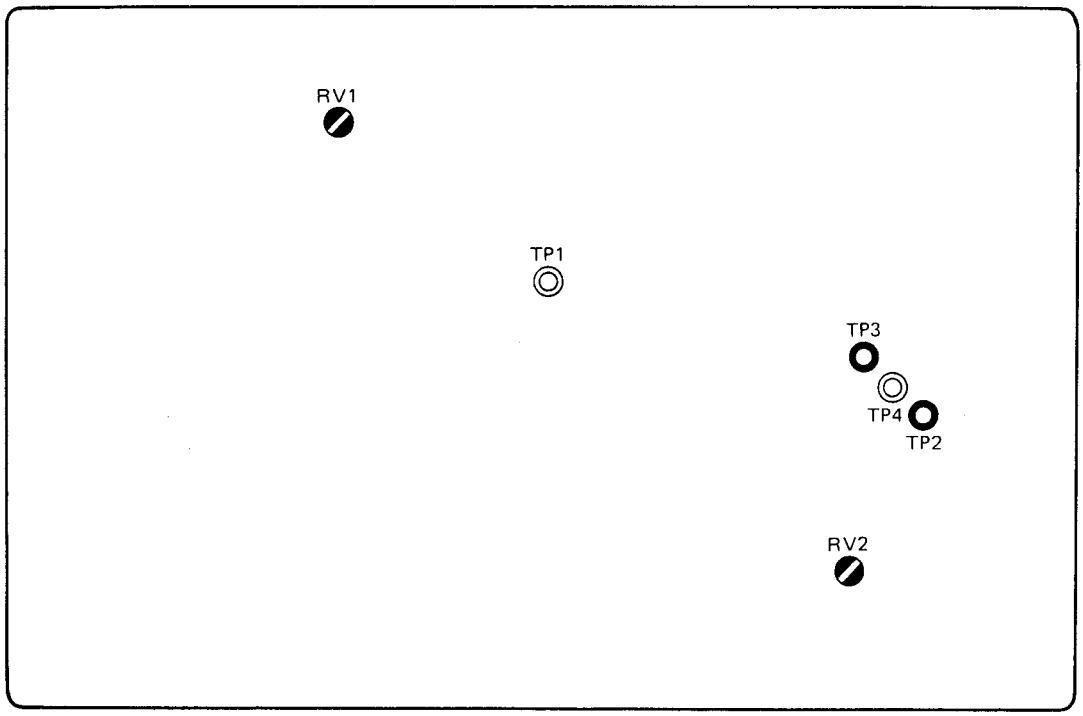
Digital voltmeter or DC voltmeter

3-1. REGURATED +9V ADJUSTMENT (FOR CP-55 BOARD)

Machine condition for adjustment	Measuring point and specification	Adjusting point
Keep normal connections	TP3/CP-55, 9.0 ± 0.05V DC	⊘RV1/CP-55

3-2. K-BUS/I-BUS LAMP BRIGHTNESS ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
Keep normal connections	TP2/CP-55, Upper limit: 5.5 ± 0.1V DC	⊘RV2/CP-55



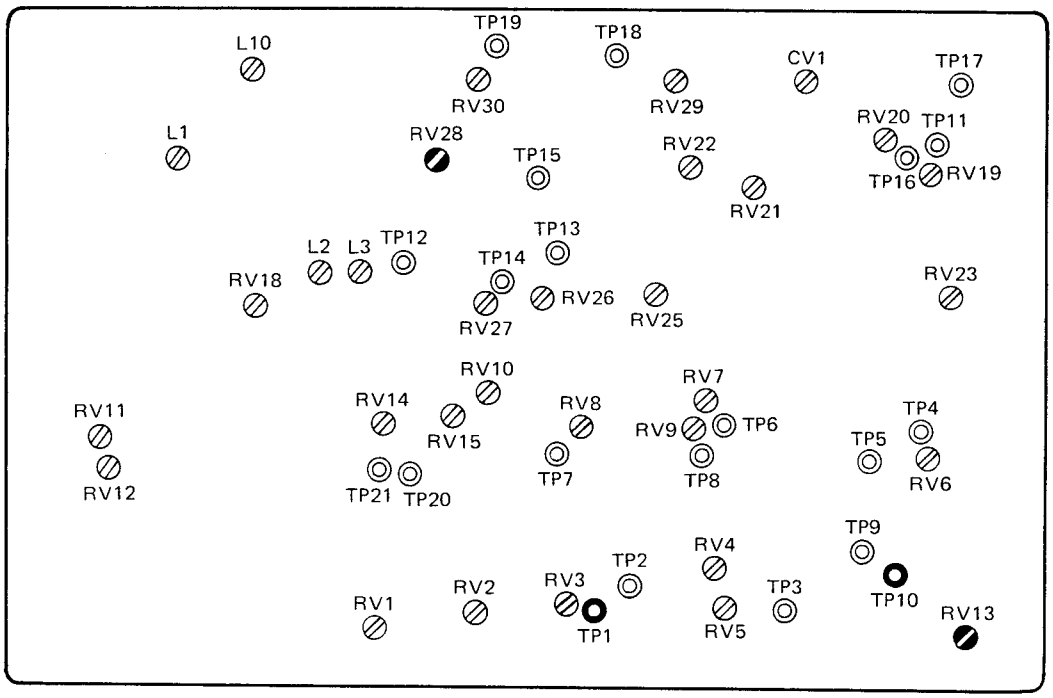
CP-55 board (Component Side)

3-3. REGURATED +9V ADJUSTMENT (FOR EF-12 BOARD)

Machine condition for adjustment	Measuring point and specification	Adjusting point
Keep normal connections	TP10/EF-12, 9.0 ± 0.05V DC	◐RV13/EF-12

3-4. REGURATED +5V ADJUSTMENT (FOR EF-12 BOARD)

Machine condition for adjustment	Measuring point and specification	Adjusting point
Keep normal connections	Pin 2 of CN-18/EF-12, 5.5 ± 0.05V DC	◐RV28/EF-12



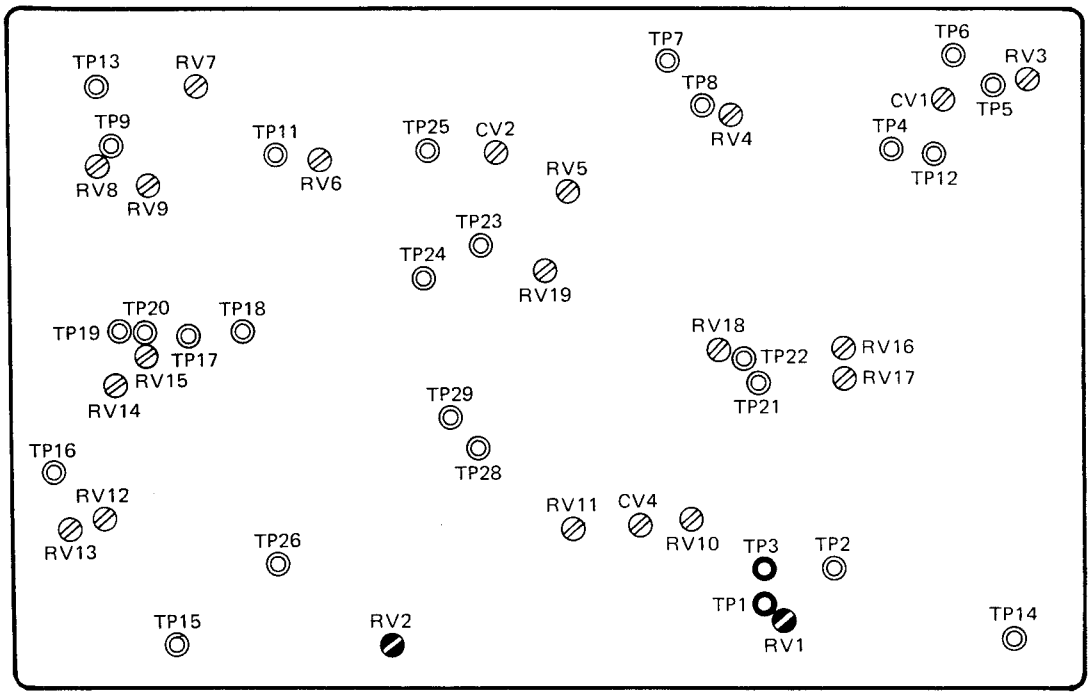
EF-12 board (Component Side)

3-5. REGURATED +9V ADJUSTMENT (FOR EF-11 BOARD)

Machine condition for adjustment	Measuring point and specification	Adjusting point
Keep normal connections	TP1/EF-11, 9.0 ± 0.05V DC	◐RV1/EF-11

3-6. REGURATED −5V ADJUSTMENT (FOR EF-11 BOARD)

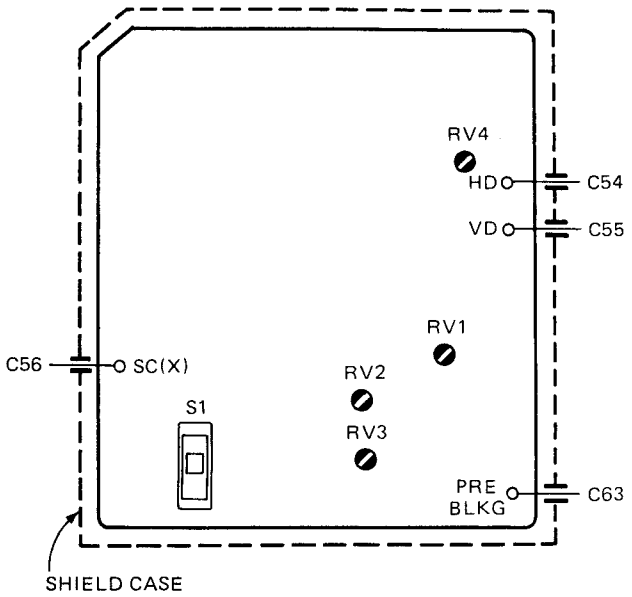
Machine condition for adjustment	Measuring point and specification	Adjusting point
Keep normal connections	TP3/EF-11, −5.0 ± 0.05V DC	◐RV2/EF-11



EF-11 board (Component Side)

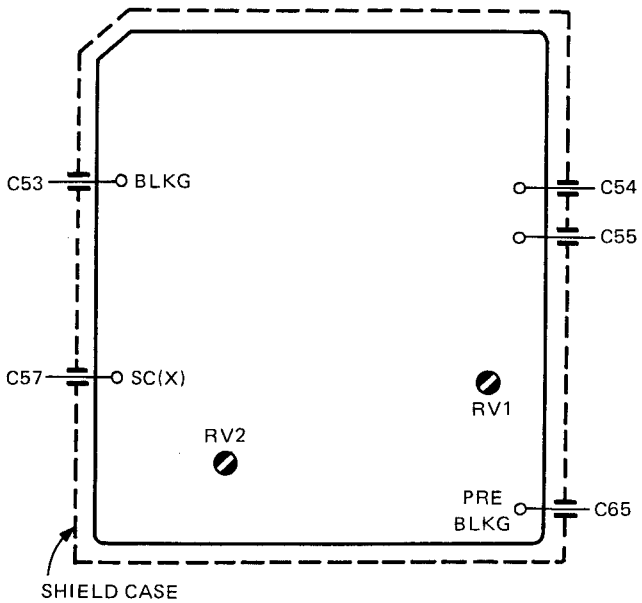
SECTION 4
SYNC GENERATOR ALIGNMENT

[For CRK-2000 use]



SG-35 board (Component Side)

[For CRK-2000P/PM use]



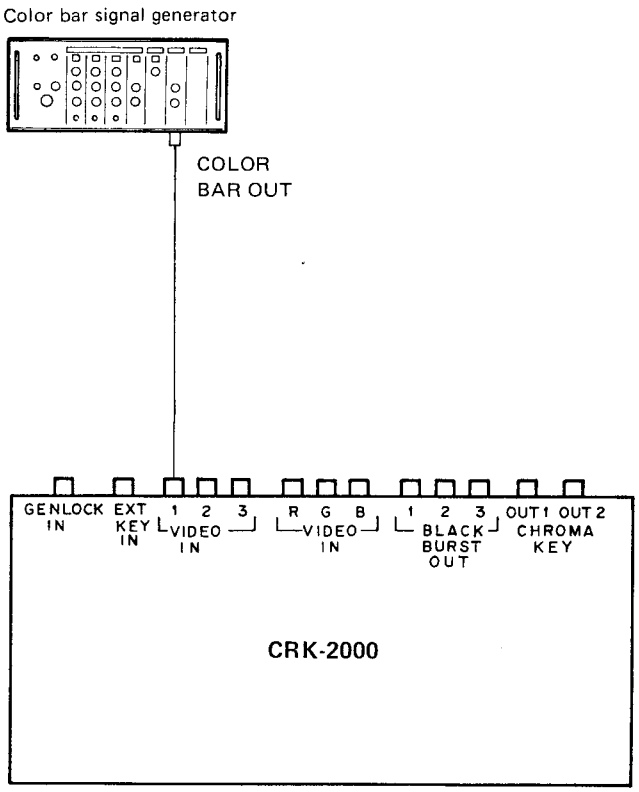
SG-34 board (Component Side)

[Instruments]

- Frequency counter
- Two-channel oscilloscope

SYNC

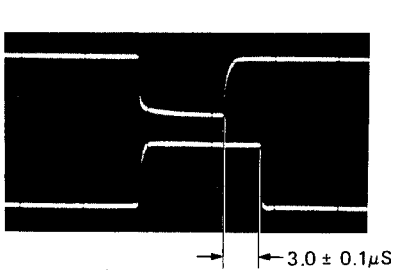
[Connection diagram]



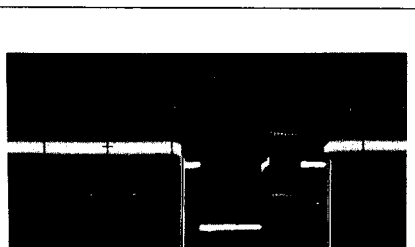
4-1. SUB-CARRIER FREQUENCY ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
	[for CRK-2000] C56 (GND: shield case)/SG-35 3,579,545 Hz ± 10 Hz	◐RV1/SG-35
	[for CRK-2000P/PM] C57 (GND: shield case)/SG-34 3,575,611 Hz ± 10 Hz	◐RV1/SG-34

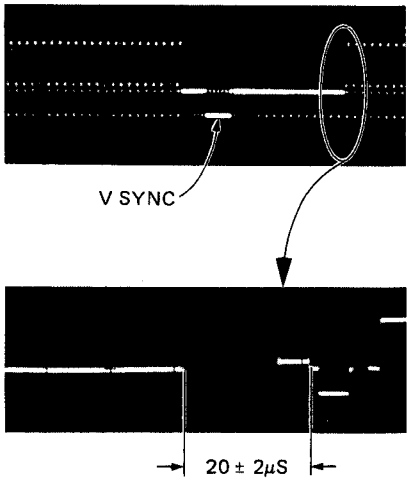
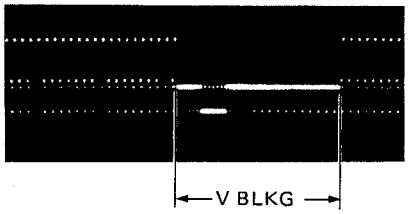
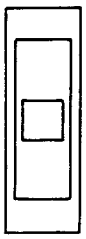
4-2. PRE BLKG WIDTH ADJUSTMENT [FOR CRK-2000 USE]

Machine condition for adjustment	Measuring point and specification	Adjusting point
	CH1 C54(HD) CH2 C63 (PRE BLKG)  3.0 ± 0.1μS	◐RV4/SG-35 EXT TRIG: HD/SG-35

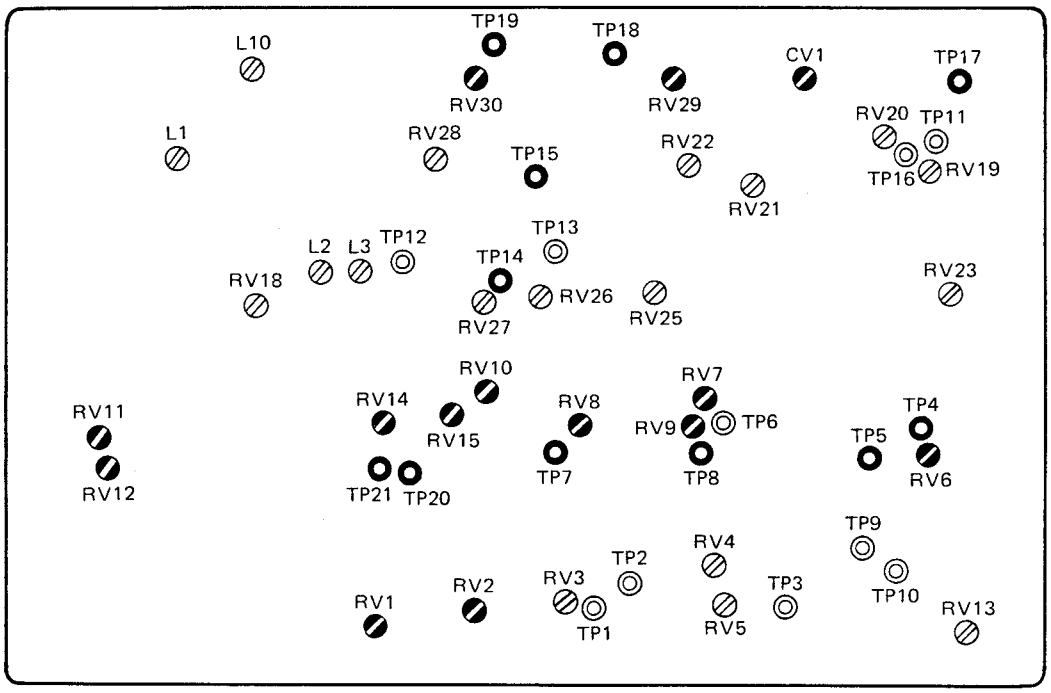
4-3. H BLKG WIDTH ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
	TP7/EF11  10.8 ± 0.2μS	◐RV2/SG-35 or SG-34 EXT TRIG: HD/SG-34 or SG-35

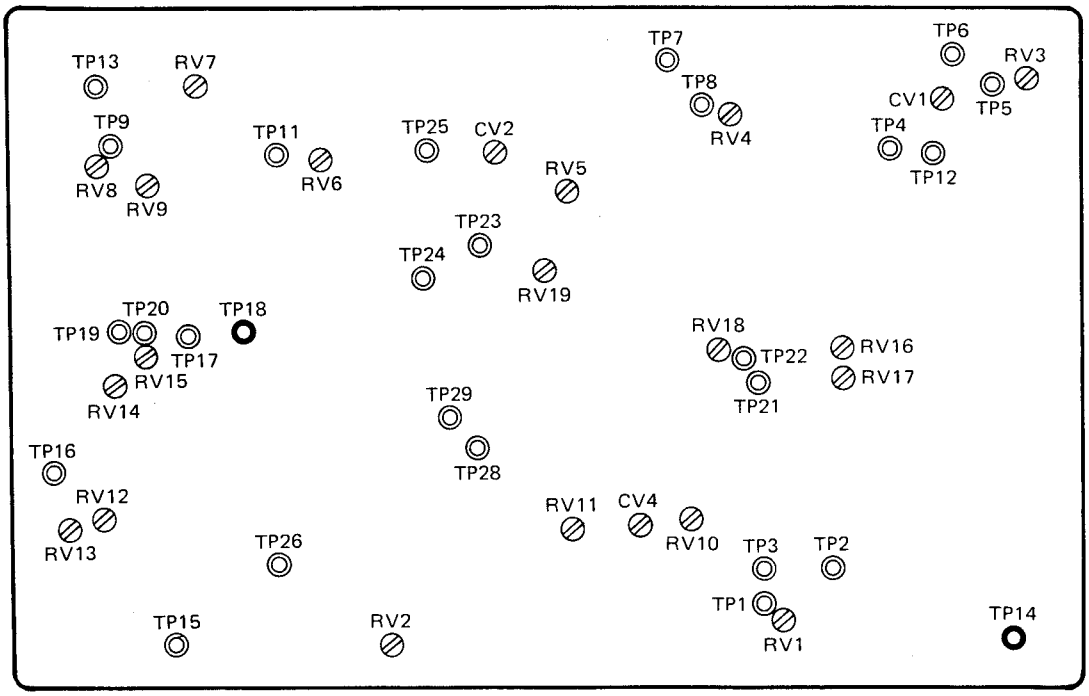
4-4. V BLKG WIDTH ADJUSTMENT [FOR CRK-2000 USE]

Machine condition for adjustment	Measuring point and specification	Adjusting point
	1. TP7/EF-11  	●RV3/SG-35 EXT TRIG: VD/SG-35
	2. TP7/EF-11  S1  (To be set before shipment)	●S1/SG-35

SECTION 5
SUB-CARRIER AND HORIZONTAL-DRIVE PHASE ADJUSTMENT



EF-12 board (Component Side)

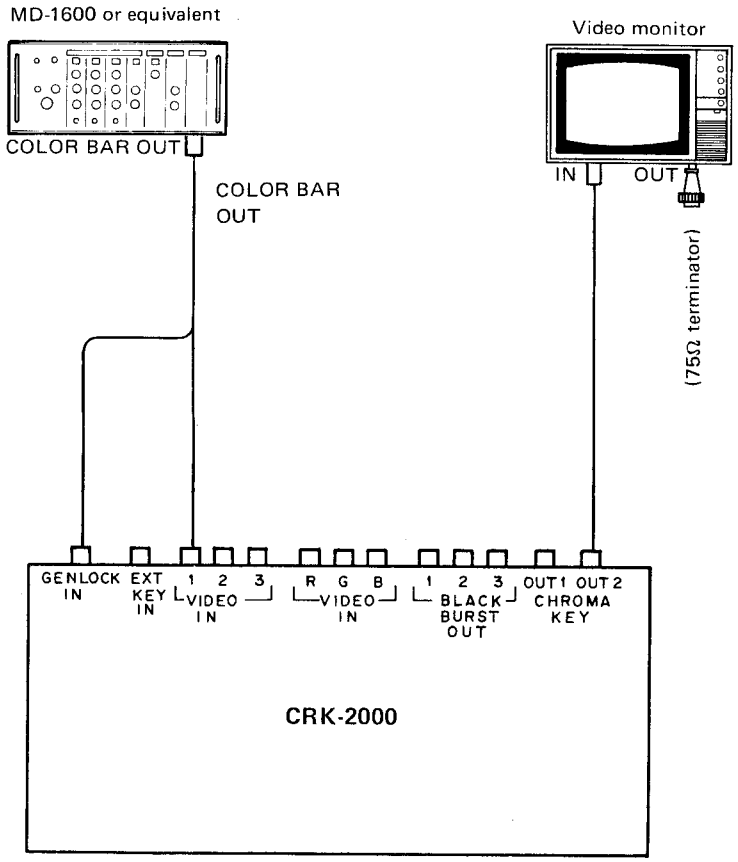


EF-11 board (Component Side)

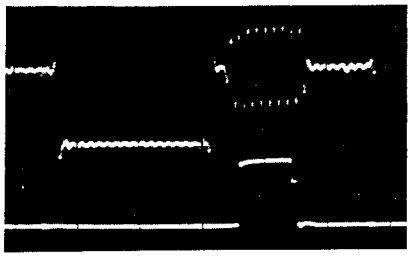
[Instruments]

- Two-channel oscilloscope
- Video monitor
- Color bar signal generator
  (Sony's multi-signal distributor MD-1600 or equivalent)

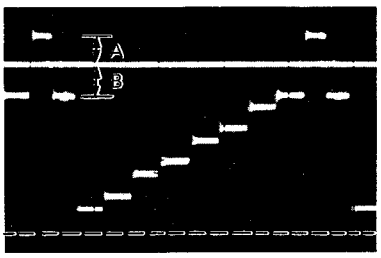
[Connection diagram]



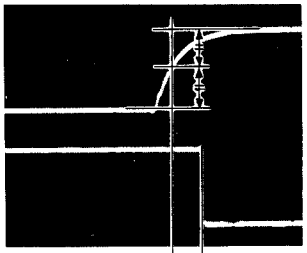
5-1. CLAMPING PHASE PRE-ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
	TP8/EF-11 TP3/EF-12  • Turn the H. PHASE control on the control panel until the clamping pulse at TP3 on the EF-12 board goes to the center of the burst signal waveform at TP8 on the EF-12 board.	H. PHASE control/control panel EXT TRIG: HD/SG-35 or SG-34

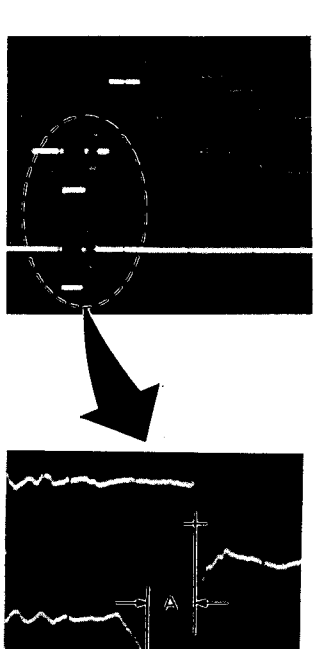
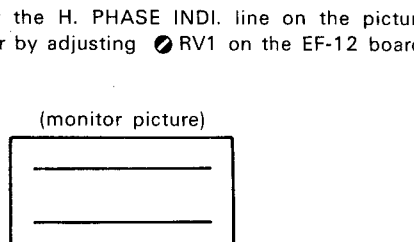
5-2. SYNC SEP. SLICING VOLTAGE ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
Mode • MODE selector: LINE SEL • KEY bus: 1	• Set the AC/DC selectors at DC, on both CH1 and CH2 of the oscilloscope, and set the vertical deflections of CH1 and CH2 at the same ground reference and same DC voltage range. CH1 TP21/EF12 CH2 TP20/EF-12 GND  A = B	◐RV14/EF-12 EXT TRIG: HD/SG-35 or SG-34

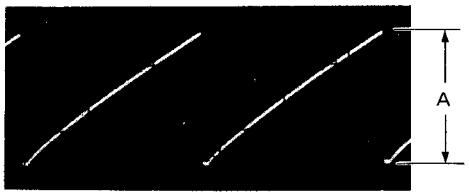
5-3. SYNC DELAY-TIME ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
	CH1 TP5/EF-12 CH2 TP2/CH7 TP7/EF-12  [CHOP mode] 250 ± 25 nsec	●RV14/EF-12 EXT TRIG: HD/SG-35 or SG-34

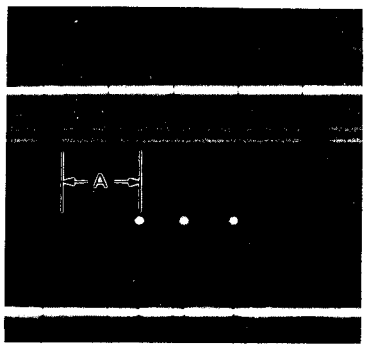
5-4. H. PHASE INDICATION SETTING

Machine condition for adjustment	Measuring point and specification	Adjusting point
Mode • CAMERA PHASE INDICATION: ON • MODE selector: LINE SEL	1. CH1 TP15/EF-12 CH2 TP14/EF-11  • Set fall time "A" at TP15 on the EF-12 board to be 0.17 ± 0.03 μs by adjusting H. PHASE control on the control panel.	H. PHASE control/ Control panel EXT TRIG: HD/SG-35 or SG-34
	2. Fully turn ⊘RV1 on the EF-12 board counterclockwise ↺.	
	3. Display the H. PHASE INDI. line on the picture monitor by adjusting ⊘RV1 on the EF-12 board.  • Set brightness on the H. PHASE INDI. line just before the diminishing point by adjusting RV1 on the EF-12 board.	⊘RV1/EF-12

5-5. H. PHASE INDICATION RAMP WAVEFORM ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
	TP4/EF-12  A = 2.5 ± 0.1 Vp-p	◐RV6/EF-12 EXT TRIG: VD/SG-35 or SG-34

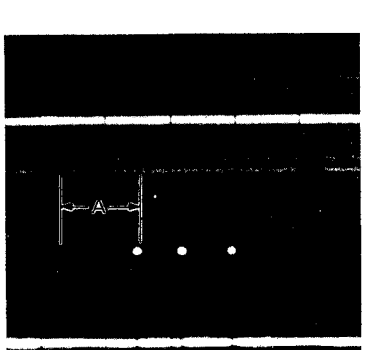
5-6. FIXED H. PHASE INDICATION LINE ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
Mode • CAMERA PHASE INDICATION: ON • MODE selector: LINE SEL • KEY bus: 2	• Connect the video cable to the VIDEO IN 2 terminal in place of the VIDEO IN 1 terminal. CH1 TP17/EF12 CH2 TP8/EF-12  A = 4.6 ± 0.2 msec [For CRK-2000/PM] A = 5.4 ± 0.2 msec [For CRK-2000P]	⊘RV12/EF-12 EXT TRIG: VD/SG-35 or SG-34

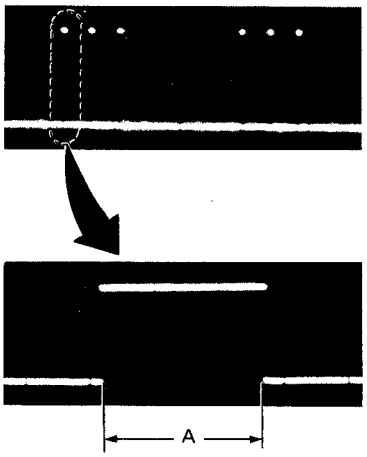
Note: After completion of adjustment specified in 5-6, perform adjustment of the H. PHASE INDI. line specified in 6-7.

5-7. H. PHASE INDI. LINE ADJUSTMENT

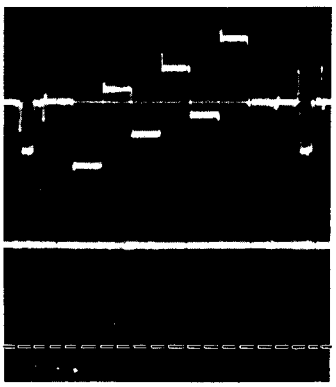
Note: Adjustment of the fixed H. PHASE INDI. line specified in item 5-6 should have been completed.

Machine condition for adjustment	Measuring point and specification	Adjusting point
Mode • CAMERA PHASE INDICATION: ON • MODE selector: LINE SEL • KEY bus: 3	• Connect the cideo cable to the VIDEO IN 3 terminal in place of the VIDEO IN 2 ternimal. CH1 TP17/EF-12 CH2 TP8/EF-12  A = 4.6 ± 0.2 msec [For CRK-2000/PM] A = 5.4 ± 0.2 msec [For CRK-2000P] • After completion of adjustment, connect the video cable to the VIDEO IN 1 terminal in place of the VIDEO IN 3 termianl.	⊘RV11/EF-12 EXT TRIG: VD/SG-35 or SG-34

5-8. H. PHASE INDICATION LINE-WIDTH ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
	TP8/EF-12  A = 250 ± 5 μsec	◐RV10/EF-12 EXT TRIG: VD/SG-35 or SG-34

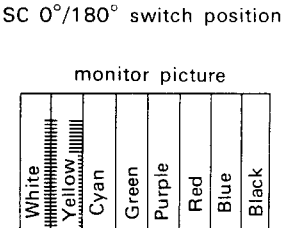
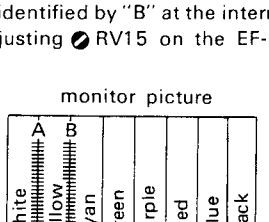
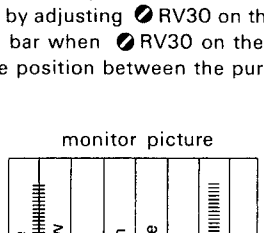
5-9. SC PHASE INDI. ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
	• Fully turn ◐RV29 on the EF-12 board clockwise ↻, and fully turn ◐RV30 on the EF-12 board counterclockwise ↺. CH1 TP18/EF-11 CH2 TP19/EF-12 GND  • Minimize the DC voltage at TP19 on the EF-12 board by alternately using the SC PHASE fine control and ◐CV1 on the EF-12 board after the B-Y signal waveform at TP18 on the EF-11 board is symmetrically arranged with respect to the base line as shown in the illustration by using the SC PHASE fine control.	SC PHASE fine control/ Control panel ◐CV1/EF-12 EXT TRIG: HD/SG-35 or SG-34

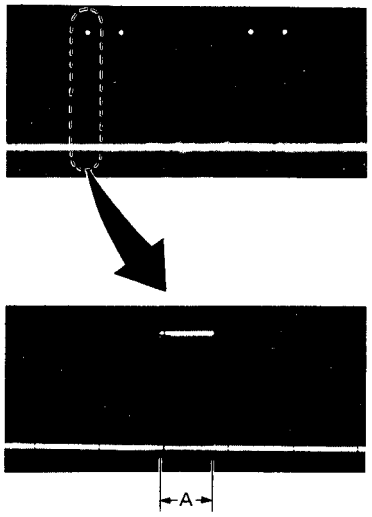
Note: After completion of adjustment specified in 5-9, perform adjustment of the SC PHASE INDICATION line specified in item 5-11.

5-10. SC PHASE INDICATION LINE ADJUSTMENT

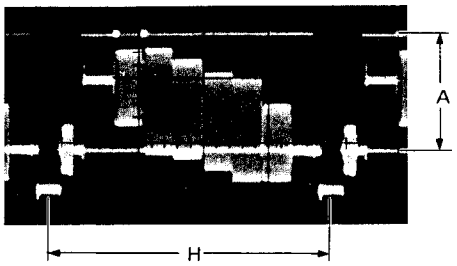
Note: Adjustment of the SC PHASE INDICATION line specified in 5-10 should have been completed.

Machine condition for adjustment	Measuring point, specification, adjusting point
Mode • CAMERA PHASE INDICATION: ON • INSERT GAIN: At intermediate clicking position	1. Fully turn ⊘RV29 on the EF-12 board clockwise ↻, and fully turn both ⊘RV15 and ⊘RV30 on the EF-12 board counterclockwise ↺. 2. Set in the leftmost position the INDICATION line, which can move on the monitor picture when the SC 0°/180° switch changes its position, by adjusting the fine SC PHASE control on the control panel. If the INDI. line does not go to the leftmost position during adjustment, change the SC 0°/180° switch position. 3. Set the other INDI. line at the intermediate position between the white and yellow bars by adjusting ⊘RV7 on the EF-12 board. Note that this INDI. line can move independently of the SC 0°/180° switch position.  4. Set the INDI. line identified by "A" which can move on the picture monitor when the SC 0°/180° switch changes its position, at the intermediate position between the yellow and cyan bars, by adjusting ⊘RV29 on the EF-12 board. 5. Set the other INDI. line identified by "B" at the intermediate position between the white and yellow bars by adjusting ⊘RV15 on the EF-12 board.  6. Change the SC 0°/180° switch position. Set the movable INDI. line in the rightmost position on the blue bar by adjusting ⊘RV30 on the EF-12 board. If the INDI. line does not move onto the blue bar when ⊘RV30 on the EF-12 board is turned, set it to the right of the intermediate position between the purple and red bars, by adjusting RV30 on the EF-12 board.  7. After completion of adjustment, set the SC 0°/180° switch at the original position.

5-11. SC PHASE INDICATION LINE-WIDTH ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
	TP8/EF-12  A = 0.8 ± 0.2μsec	◐RV9/EF-12 EXT TRIG: HD/SG-35 or SG-34

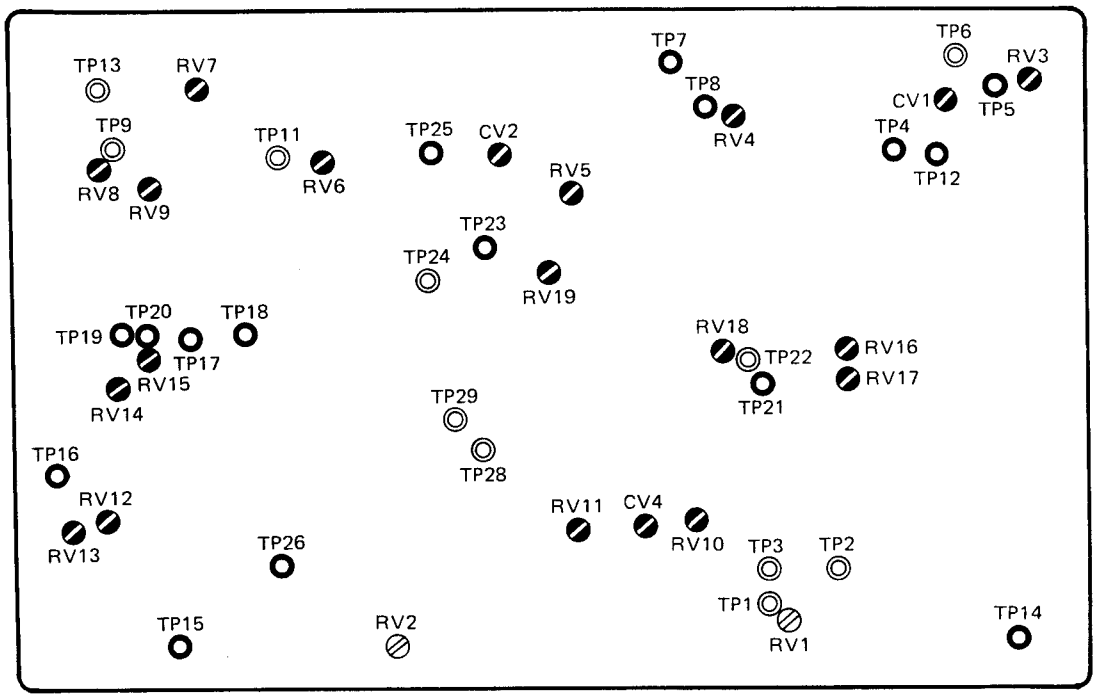
5-12. PHASE INDICATION SIGNAL LEVEL ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
Mode • CAMERA PHASE INDICATION: ON	TP7/EF-11  A = 0.8 ± 0.02V	⊘RV4/EF-11 EXT TRIG: HD/SG-35 or SG-34

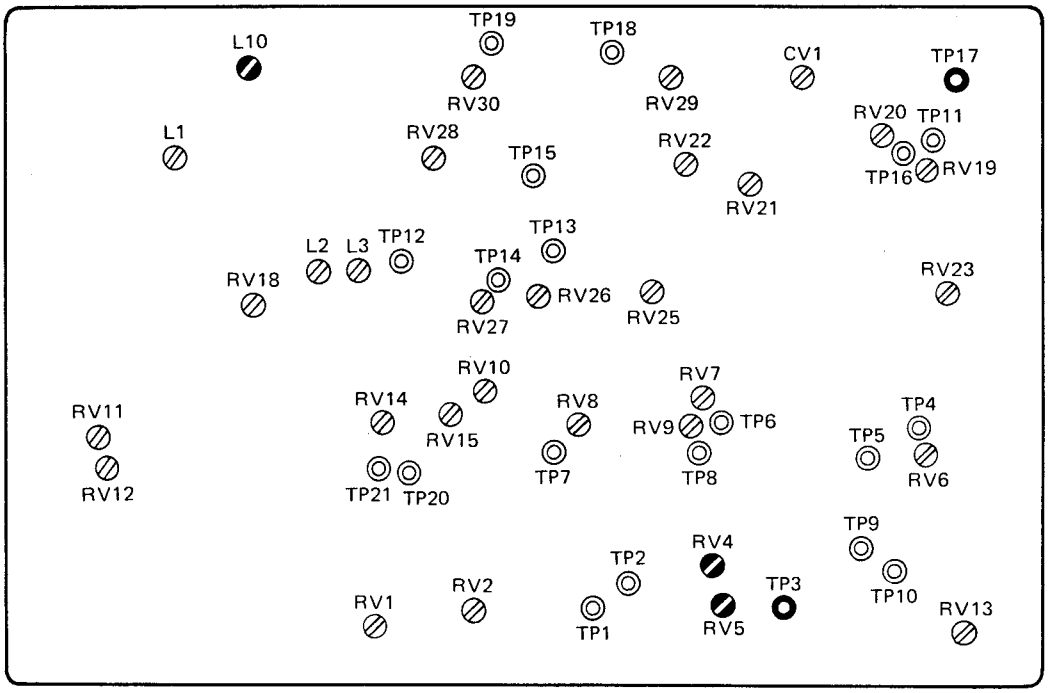
5-13. BLKG. SIGNAL PHASE SETTING

Machine condition for adjustment	Measuring point and specification	Adjusting point
	Fully turn ⊘RV2 on the EF-12 board clockwise ↻.	⊘RV2/EF-12

SECTION 6
EFFECTING SYSTEM ADJUSTMENT



EF-11 board (Component Side)



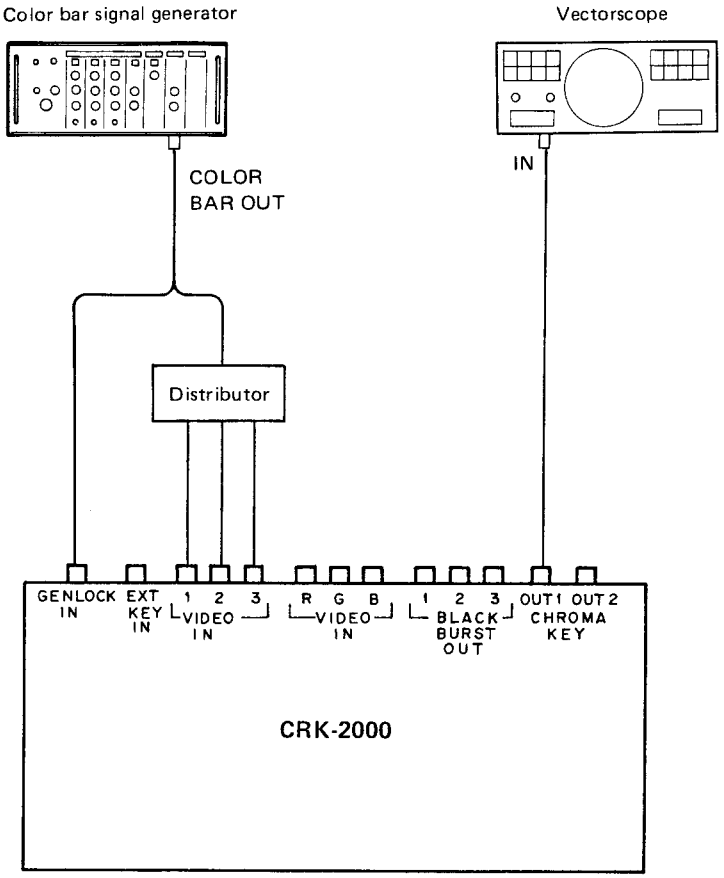
EF-12 board (Component Side)

[Instruments]

- Two-channel oscilloscope
- Vectorscope
- Color bar signal generator
  (Sony's multi-signal distributor MD-1600 or equivalent)

[Connection diagram]

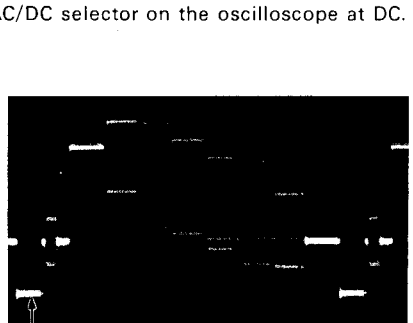
Note: When a color bar signal branches into the VIDEO 1, VIDEO 2, and VIDEO 3 terminals, the respective color bar signals should be equal in phase.



6-1. SLICE VOLTAGE ADJUSTMENT

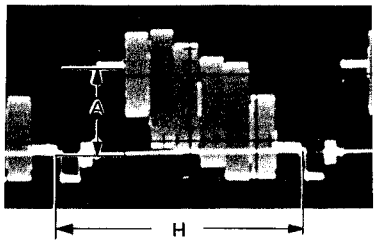
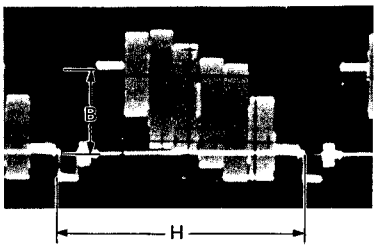
Machine condition for adjustment	Measuring point and specification	Adjusting point
	1. Fully turn the THRESHOLD control counterclockwise ↺. Set the AC/DC selector on the oscilloscope at DC. TP21/EF-11 A GND A = 4 ± 0.2VDC	⊘ RV16/EF-11
	2. Fully turn the THRESHOLD control clockwise ↻. GND B TP21/EF-11 B = −0.8 ± 0.05VDC	⊘ RV17/EF-11

6-2. EXT. SIGNAL WAVEFORM ADJUSTMENT

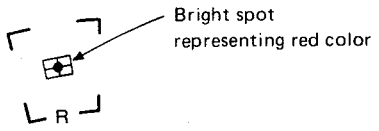
Machine condition for adjustment	Measuring point and specification	Adjusting point
	• Connect the video cable to the EXT. KEY terminal in place of the VIDEO IN 1 terminal. • Set the AC/DC selector on the oscilloscope at DC. TP23/EF-11 GND  A = 2 ± 0.2VDC	⊘ RV19/EF-11 EXT TRIG: HD/SG-35 or SG-34

Note: After completion of adjustment specified in 6-2, connect the video cable to the VIDEO IN 1 terminal in place of the EXT. KEY terminal.

6-3. Y-SIGNAL LEVEL ADJUSTMENT (K-BUS OUT)

Machine condition for adjustment	Measuring point and specification	Adjusting point
Mode • CAMERA PHASE INDICATION: OFF • MODE selector: LINE SEL • KEY bus: 1	1. TP14/EF-11  • Measure the voltage level specified by "A".	EXT TRIG: HD/SG-35 or SG-34
	2. Set the probe chip of the oscilloscope at TP8 on the EF-11 board in place of TP14 on the EF-11 board. TP8/EF-11  • Set the voltage level specified by "B" to be equal to that specified by "A" in item 1 by adjusting ◐RV10 on the EF-11 board.	◐RV10/EF-11 EXT TRIG: HD/SG-35 or SG-34

6-4. C-SIGNAL LEVEL ADJUSTMENT (K-BUS OUT)

Machine condition for adjustment	Measuring point and specification	Adjusting point
Mode • MODE selector: LINE SEL • KEY bus: 1	1. Set the burst signal level on the vectorscope at 75% by adjusting the PHASE adjuster. 2. Place the bright spot representing red color of the color bar signal at the center of the corresponding quadrangular mark on the vector scope by adjusting ◐CV4 on the EF-11 board.  	◐CV4/EF-11

6-5. DG·DP ADJUSTMENT

[Equipment Required]

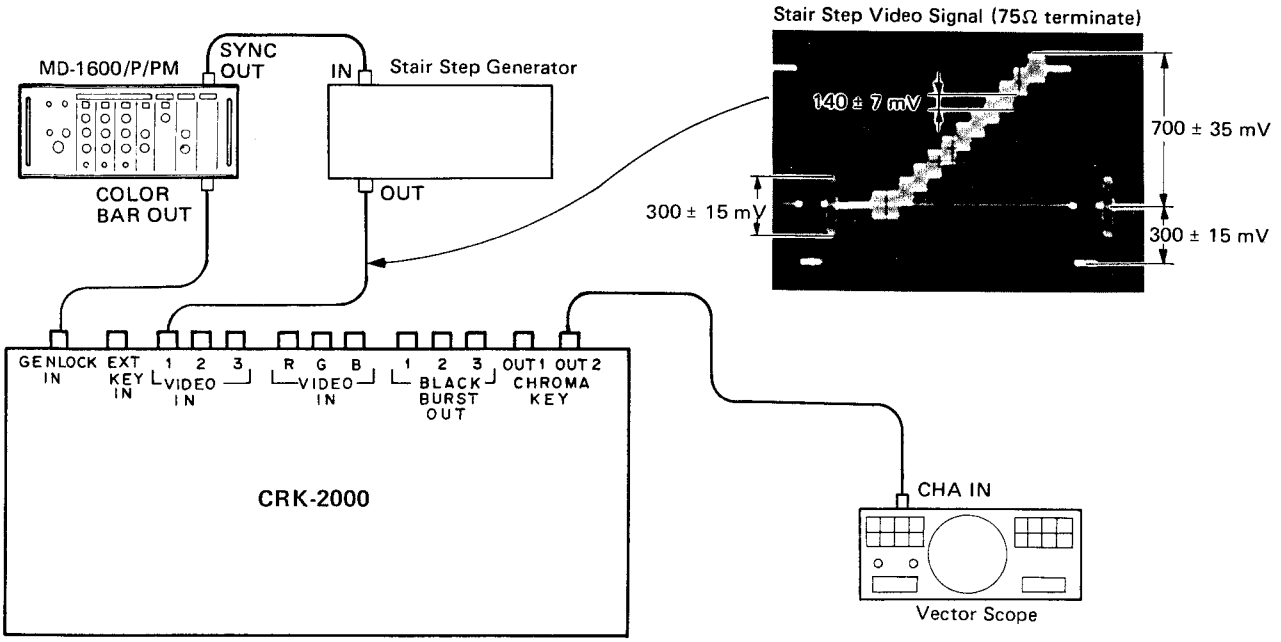


Fig. 9-3. Connection & ten-step modulated staircase linearity signal

[DG·DP MEASUREMENT]

Note: Make use of Tektronix type 520A.

1. DG (DIFF. GAIN) Measurement

Change the signal source to the ten-step modulated-staircase linearity signal; see Fig. 9-3. Depress VECTOR pushbutton, change the CHANNEL A GAIN switch to MAX GAIN, and adjust CHANNEL A GAIN control to place the staircase vector tip on the outer ring of the vector graticule (disregard the burst vector). Check that Aϕ, FULL FIELD and CH A pushbuttons are still engaged Depress the Y pushbutton. A luminance staircase waveform is displayed.

Depress the DIFF GAIN pushbutton and use the VERT POSITION control to place the left side of the trace on the 0 graticule line (scale on right). Each vertical marker indicates one linearity step, making it possible to measure differential gain between any two points on the staircase.

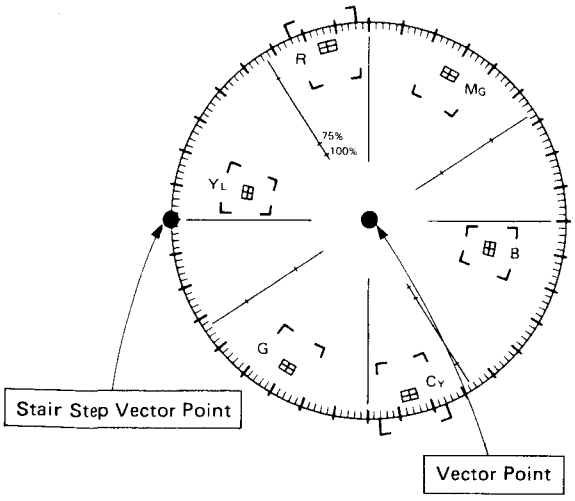


Fig. 9-4. Ten-step luminance staircase waveform

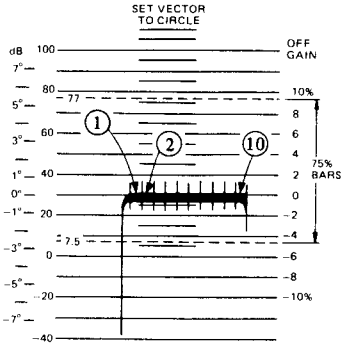


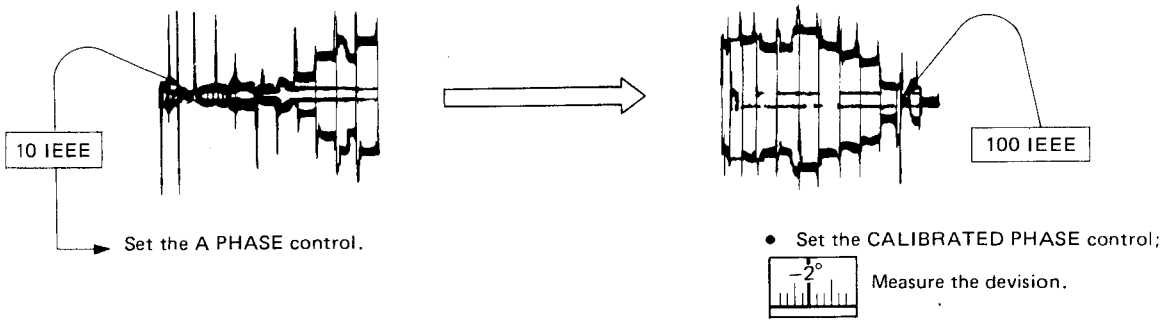
Fig. 9-5. No differential gain over a ten-step staircase

2. DP (DIFF. PHASE) Measurement

Depress the VECTOR pushbutton, set the CHANNEL A gain switch to MAX GAIN and adjust the GAIN control to place the staircase vector on the graticule outer ring (disregard the burst vector). Set the CALIBRATED PHASE dial to 0. Set the DIFF. PHASE slide switch to DOUBLE. Depress the DIFF. PHASE pushbutton and adjust the CHANNEL A PHASE control for a null at the first staircase step.

Differential phase may be measured peak to peak, from the first step (black level) to the last step (white level) or step to step. If a ramp waveform is used, the measurement should be made from the initial null to the peak amplitude.

Since a null is now present at the black level, simply adjust the CALIBRATED PHASE control until a null occurs at the point where the differential phase is to be measured. The CALIBRATED PHASE dial now reads the differential phase between two other points is to be made, null one of the levels and read the dial, then null the other level and subtract the smaller reading from the larger to provide the differential phase between the two levels.

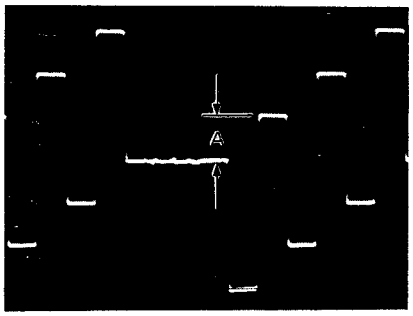
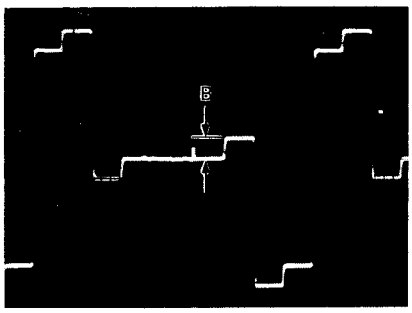


Machine condition for adjustment	Measuring point and specification	Adjusting point
• MODE selector: LINE SEL • KEY bus: 1	CHROMA KEY OUT 1/connector panel Spec. APL / DG / DP 10% / less than 1.5% / less than 1.5° 90% / less than 1.5% / less than 1.5° The specified value should be satisfied whenever it is based on a method of measurement.	⊘RV11/EF-11

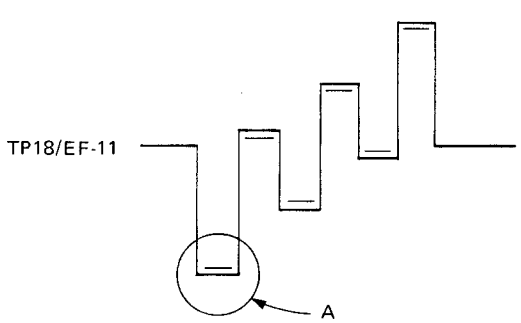
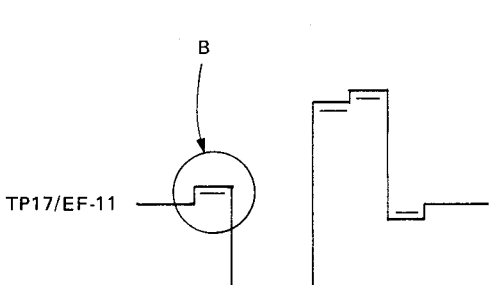
EFFECT

6-6. CHROMA DIFFERENCE HUE LINE SET

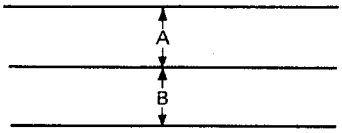
[For CRK-2000]

Machine condition for adjustment	Measuring point and specification	Adjusting point
• SC 0°/180° switch: 180° • MODE selector: LINE SEL	1. TP18/EF-11  A = 120 ± 20 mV	SC PHASE fine control screw/ control panel **Note**: When the polarity of waveform isn't fit, select the mode of SC 0°/ 180° switch. EXT TRIG: HD/SG-35
	2. TP17/EF-11  B = 120 ± 20 mV	◐L10/EF-12 EXT TRIG: HD/SG-35

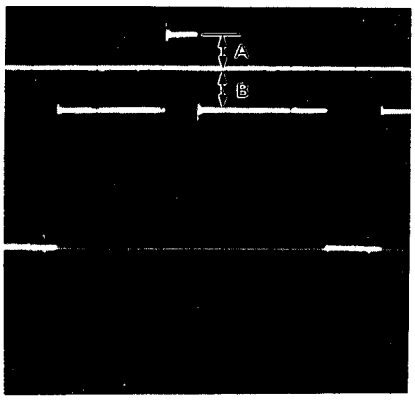
[For CRK-2000P/PM]

Machine condition for adjustment	Measuring point and specification	Adjusting point
• SC 0°/180° switch: 180° • MODE selector: LINE SEL	1.  • Adjust the SC PHASE fine control screw of control panel so that a part of "A" of waveform becomes a piece of a line.	SC PHASE fine control screw/ control panel EXT TRIG: HD/SG-34
	2.  • Adjust the ◐L10/EF-12 so that a part of "B" of waveform becomes a piece of a line.	◐L10/EF-12 EXT TRIG: HD/SG-34

6-7. HUE CONT VOLTAGE ADJUSTMENT

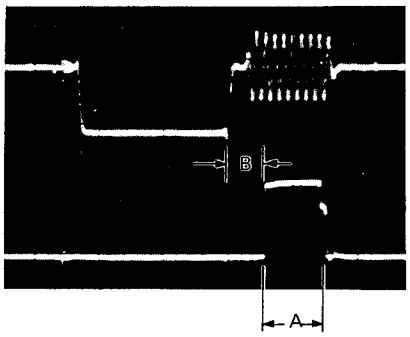
Machine condition for adjustment	Measuring point and specification	Adjusting point
	• Set the AC/DC selector on the oscilloscope at DC, and set the vertical deflections of CH1 and CH2 at the same ground reference and same DC voltage range. TP19/EF-11 DC potential at pin 10 of IC-18 on EF-11 TP20/EF-11  A = +0.7 ± 0.05VDC B = −0.7 ± 0.05VDC	A; ⊘ RV14/EF-11 B; ⊘ RV15/EF-11

6-8. KEY SET ADJUSTMENT

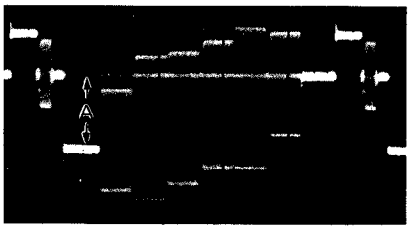
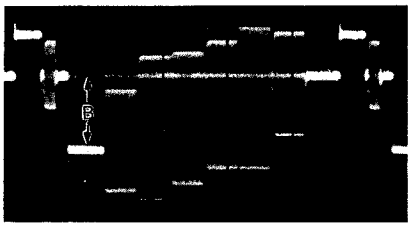
Machine condition for adjustment	Measuring point and specification	Adjusting point
Mode • MODE selector: CHROMA KEY • KEY bus: 1 • INSERT bus: BACKGROUND COLOR	• Set both the HUE and THRESHOLD controls at the positions where the green bar can be sampled from the color bar signal as the key signal. • Set the AC/DC selector on the oscilloscope at DC, and set the vertical deflections of CH1 and CH2 at the same ground reference and same DC voltage range. CH1 TP5/EF-11 CH2 TP4/EF-11 GND  • Set "A" equal to "B" in amplitude on the KEY PULSE voltage waveform at TP4 on the EF-11 board, referring to the DC potential at TP5 on the EF-11 board, by adjusting ⊘RV18 on the EF-11 board.	⊘RV18/EF-11 EXT TRIG: HD/SG-35 or SG-34

EFFECT

6-9. CLP PULSE 1 ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
	CH1 TP15/EF-12 CH2 TP3/EF-12  A = 1.8 ± 0.1μsec B = 1.1 ± 0.1μsec [for CRK-2000/PM] B = 1.4 ± 0.1μsec [for CRK-2000P]	A; ⊘ RV5/EF-12 B; ⊘ RV4/EF-12 EXT TRIG: HD/SG-35 or SG-34

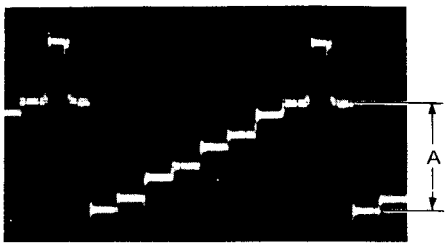
6-10. Y-SIGNAL LEVEL ADJUSTMENT (I-BUS OUT)

Machine condition for adjustment	Measuring point and specification	Adjusting point
Mode • MODE selector: CHROMA KEY • KEY bus: 1 • INSERT bus: 1	1. TP26/EF-11  • Measure the voltage level specified by "A".	EXT TRIG: HD/SG-35 or SG-34
	2. Set the probe chip of the oscilloscope at TP25 on the EF-11 in place of TP26 on the EF-11 board. TP25/EF-11  • Set "B" equal to "A" specified in item 1 by adjusting ⊘RV5 on the EF-11 board.	⊘RV5/EF-11 EXT TRIG: HD/SG-35 or SG-34

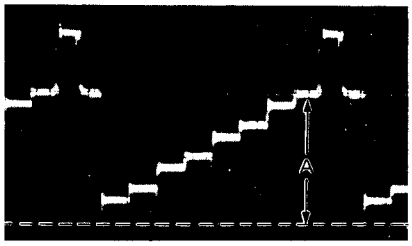
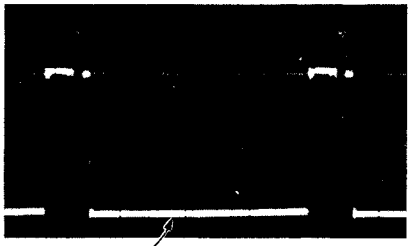
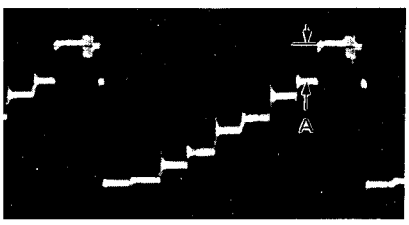
6-11. INSERT GAIN ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
Mode • MODE selector: CHROMA LEY • KEY bus: 1 • INSERT bus: 1 • LUM Control: ↻ MAX. • INSERT GAIN: At intermediate clicking position	1. TP15/EF-11 • Measure the voltage level specified by "A".	EXT TRIG: HD/SG-35 or SG-34
	2. Set the prove chip of the oscilloscope at TP12 on the EF-11 board in place of TP15 on the EF-11 board. TP12/EF-11 • Set "B" equal to "A" specified in item 1 by adjusting ⊘RV6 on the EF-11 board.	⊘RV6/EF-11 EXT TRIG: HD/SG-35 or SG-34

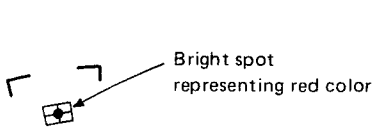
6-12. PEAK Y-SIGNAL VOLTAGE LEVEL ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
	TP16/EF-11  A = 240 ± 20 mV	⊘RV13/EF-11 EXT TRIG: HD/SG-35 or SG-34

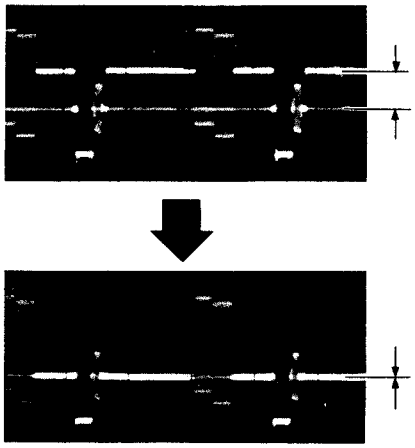
6-13. Y MOD. SETTING

Machine condition for adjustment	Measuring point and specification	Adjusting point
Mode • MODE selector: CHROMA KEY • KEY bus: 1 • INSERT bus: BACKGROUND COLOR • Joystick control: At mechanically intermediate position • LUM control: ↻ MAX.	1. Set the AC/DC selector of the oscilloscope at DC. TP16/EF-11 GND  A = 2.4 ± 0.1VDC	◐RV12/EF-11 EXT TRIG: HD/SG-35 or SG-34
	2. Fully turn the NATURAL/HARD control toward HARD. TP12/EF-11  Just before the line becomes flat (Just before the staircase disappears) • Set the line in the above illustration just before the point where it becomes flat (the staircase disappears) by adjusting ◐RV9 on the EF-11 board.	◐RV9/EF-11 EXT TRIG: HD/SG-35 or SG-34
	3. Fully turn the NATURAL/HARD control toward NATURAL ↻, and then turn it clockwise ↺ by about 30°. TP12/EF-11  • When the color bar signal to be input has a set-up: A = 120 ± 10 mV When the color bar signal to be input has no set-up: A = 50 ± 10 mV	◐RV8/EF-11 EXT TRIG: HD/SG-35 or SG-34

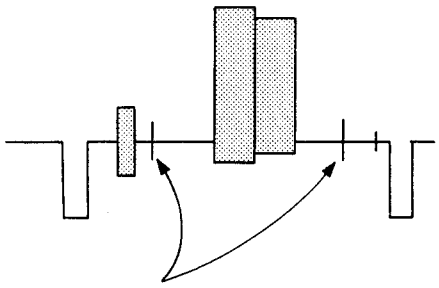
6-14. C-SIGNAL LEVEL ADJUSTMENT (I-BUS OUT)

Machine condition for adjustment	Measuring point and specification	Adjusting point
Mode • INSERT GAIN: At intermediate clicking position • KEY LEVEL: ◯ MAX. • MODE selector: EXT KEY • KEY bus: 1 • INSERT bus: 2	1. Set the burst signal level at 75% on the vector scope by adjusting the PHASE adjuster.	
	2. Set the NORMAL/INVERT selector at INVERT. Set the bright spot representing red color at the position of phase specified in item 1 by alternately adjusting ⊘CV1 and ⊘CV2 on the EF-11 board.  	⊘CV1/EF-11 ⊘CV2/EF-11

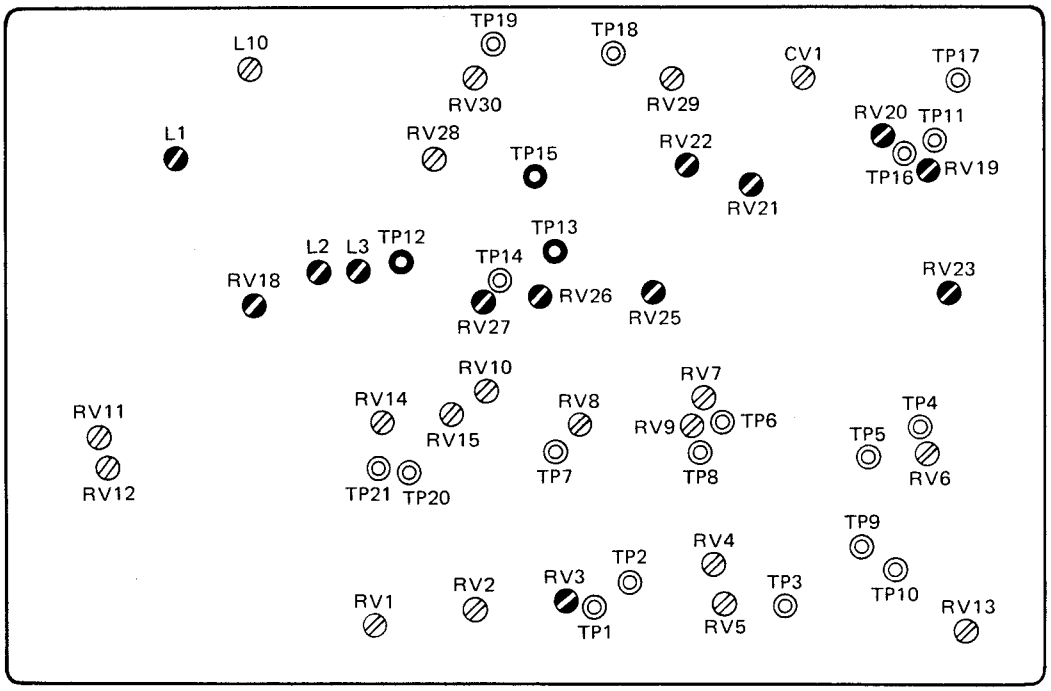
6-15. K-BUS/I-BUS DC VOLTAGE ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
Mode • MODE selector: CHROMA KEY • KEY bus: 1 • INSERT bus: 3 • THRESHOLD controller: ↻ MAX.	TP8/EF-11 	⊘RV7/EF-11 EXT TRIG: HD/SG-35 or SG-34

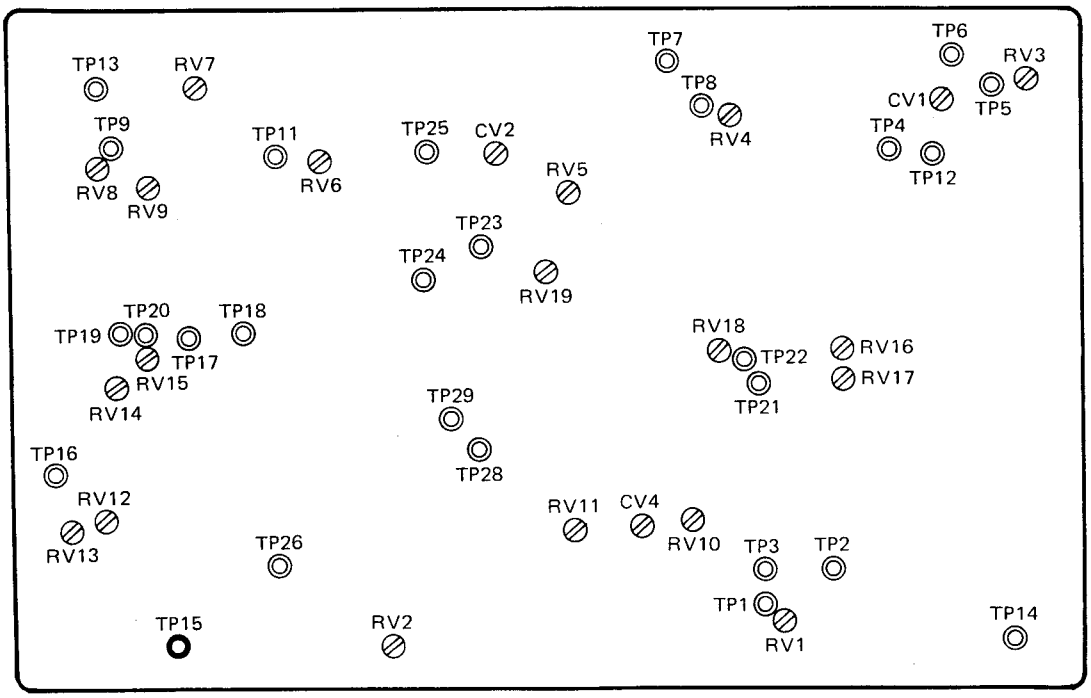
6-16. EFFECT AMP. DC BIASING ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
Mode • LUM control: ↺ MIN. • Joystick controller: At mechanically intermediate position • THRESHOLD control: ↻ MAX. • INSERT bus: BACKGROUND	TP8/EF-11  • Minimize the spikes by adjusting ⊘ RV3 on the EF-11 board.	⊘RV3/EF-11 EXT TRIG: HD/SG-35 or SG-34

SECTION 7
BACKGROUND SYSTEM ADJUSTMENT



EF-12 board (Component Side)

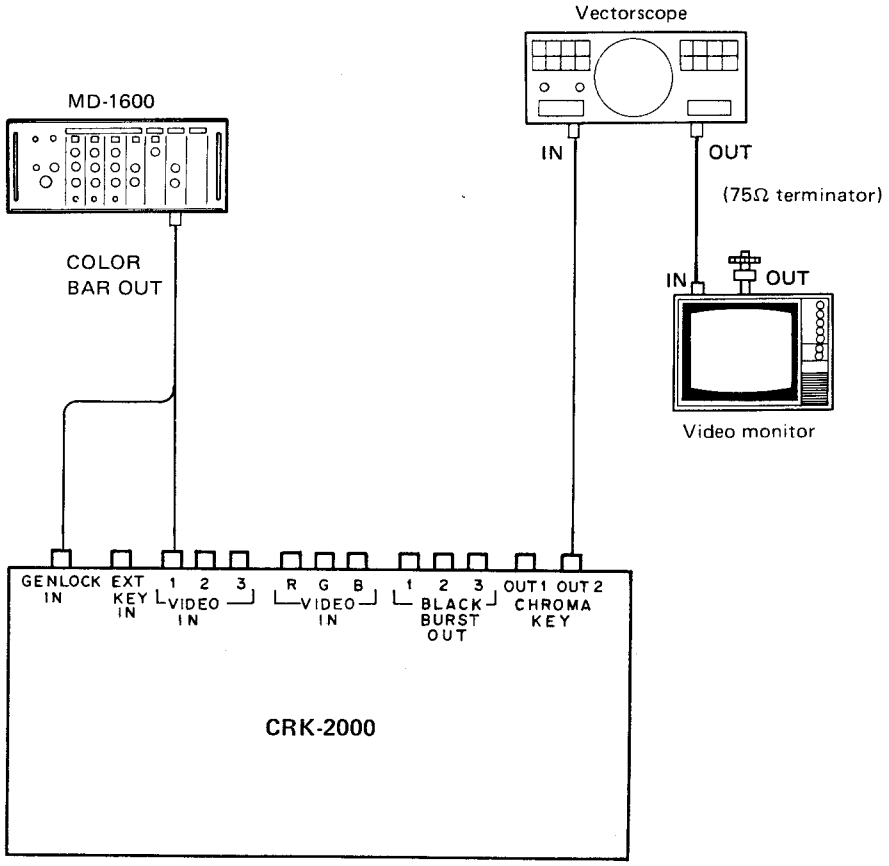


EF-11 board (Component Side)

[Instruments]

- Vectorscope
- Video monitor
- Two-channel oscilloscope
- Color bar signal generator
  (Sony's milti-signal distributor MD-1600 or equivalent)

[Connection diagram]

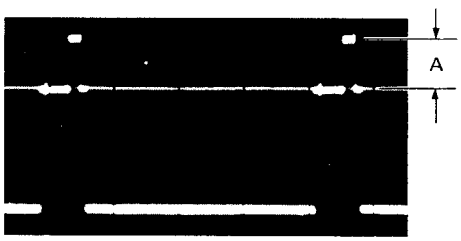


7-1. SYNC PHASE SETTING

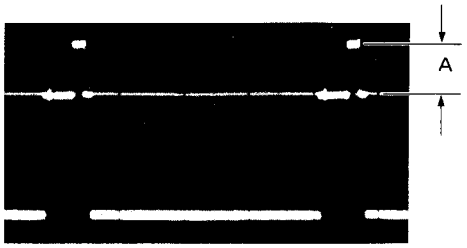
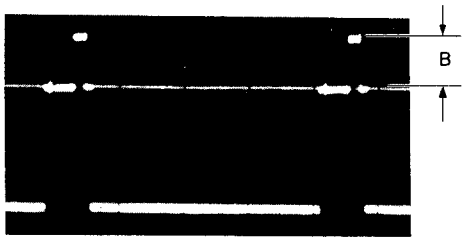
Machine condition for adjustment	Measuring point and specification	Adjusting point
	• Fully turn ⊘RV3 on the EF-12 board counterclockwise.	⊘RV3/EF-12

7-2. BACKGROUND COLOR B-Y BF ADJUSTMENT

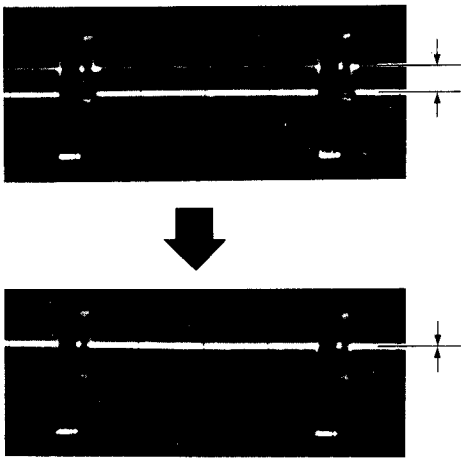
[For use in CRK-2000]

Machine condition for adjustment	Measuring point and specification	Adjusting point
Fully incline the joystick controller leftwards.	TP13/EF-12  A = 0.4 ± 0.05V	⊘RV25/EF-12 EXT TRIG: HD/SG-35

[For use in CRK-2000 P/PM]

Machine condition for adjustment	Measuring point and specification	Adjusting point
Fully incline the joystick controller leftwards.	1. TP13/EF-12  A = 0.4 ± 0.05V	◐RV25/EF-12 EXT TRIG: HD/SG-34
	2. TP14/EF-12  B = 0.4 ± 0.05V	◐RV24/EF-12 EXT TRIG: HD/SG-34

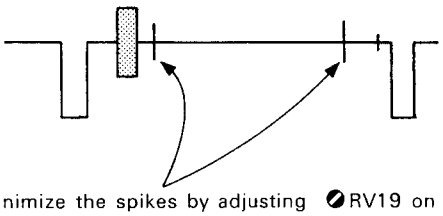
7-3. BALANCE-1 ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
	1. Set both ⊘RV21 and ⊘RV22 on the EF-12 board at their mechanically intermediate positions.	⊘RV21/EF-12 ⊘RV22/EF-12
	2. TP15/EF-12 	⊘RV20/EF-12 EXT TRIG: HD/SG-35 or SG-34

Note: After completion of adjustment specified in 7-3, perform adjustment of BALANCE-2 specified in 7-5.

7-4. BALANCE-2 ADJUSTMENT

Note: Adjustment of BALANCE-1 specified in 7-4 should have been completed.

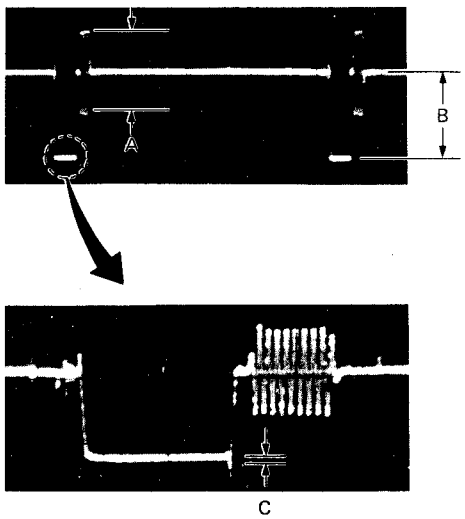
Machine condition for adjustment	Measuring point and specification	Adjusting point
	TP15/EF-12  • Minimize the spikes by adjusting ⊘RV19 on the EF-12 board.	⊘RV19/EF-12 EXT TRIG: HD/SG-35 or SG-34

Note: After completion of adjustment specified in 7-4, perform adjustment of BLACK BURST specified in 7-6.

7-5. BLACK BURST ADJUSTMENT

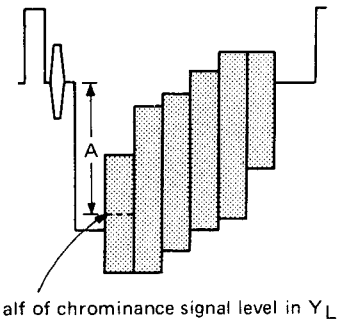
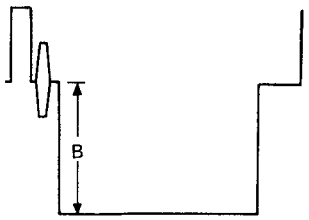
Note: Adjustment of BALANCE-2 specified in 7-5 should have been completed.

BACK GROUND

Machine condition for adjustment	Measuring point and specification	Adjusting point
• Connect the 75Ω terminator to the BLACK BURST OUT 3 terminal.	TP15/EF-12  • A = B = 300 ± 30 mV • Minimize "C" by alternately adjusting ⊘ RV26 and ⊘ RV27 on the EF-12 board.	A; ⊘ RV22/EF-12 B; ⊘ RV21/EF-12 C; ⊘ RV26/EF-12 ⊘ RV27/EF-12 EXT TRIG: HD/SG-35 or SG-34

Note: After completion of adjustment specified in 7-5, perform adjustment of BACKGROUND COLOR phase specified in 7-7.

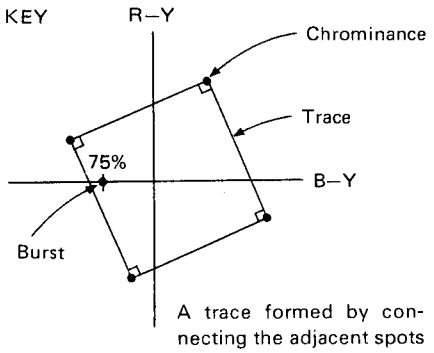
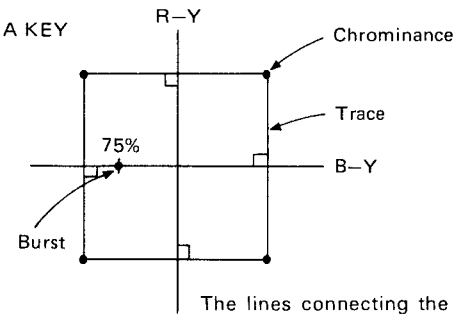
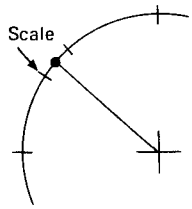
7-6. BACKGROUND COLOR Y-SIGNAL LEVEL ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
Mode • Joystick controller: At mechanically intermediate position • KEY bus: 1 • INSERT bus: "BACKGROUND" • MODE selector: CHROMA KEY • LUM adjuster: ↻ MAX. • NATURAL/HARD: ↺ HARD • INSERT GAIN: At mechanically intermediate position	1. TP15/EF-11  Half of chrominance signal level in Y_L • Measure the voltage level specified by "A".	EXT TRIG: HD/SG-35 or SG-34
	2. Set the probe chip of the oscilloscope at TP12 on the EF-11 board in place of TP15 on the EF-11 board. TP12/EF-11  • Set "B" equal to "A" specified in item 1 by adjusting ◐ RV23 on the EF-12 board.	◐RV23/EF-12 EXT TRIG: HD/SG-35 or SG-34

7-7. BACKGROUND COLOR PHASE ADJUSTMENT

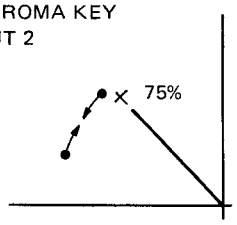
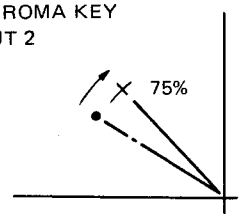
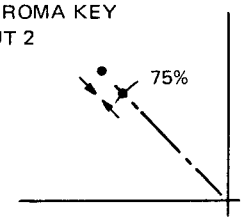
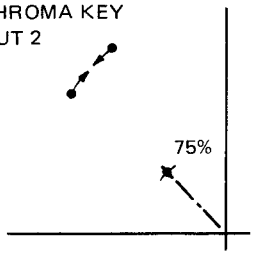
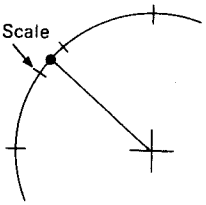
Note: Adjustment of BLACK BURST specified in 7-6 should have been completed.

[For use in CRK-2000]

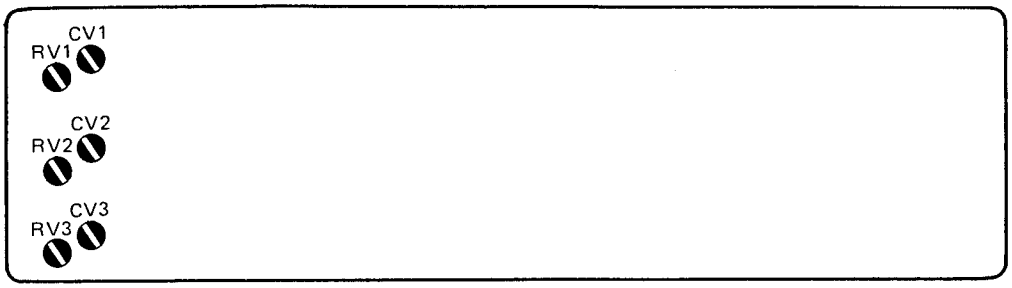
Machine condition for adjustment	Measuring point and specification	Adjusting point
Mode • THRESHOLD adjuster: ↻MAX. • MODE selector: CHROMA KEY • CAMERA PHASE INDICATION: OFF • NATURAL/HARD: ↺ HARD • KEY bus: 1 • INSERT bus: "BACKGROUND COLOR" • LUM adjuster: ↻ MAX. • INSERT GAIN: At mechanically intermediate clicking position	1. Adjustment of the subcarrier phase at 90 degrees. Preliminary operation: Fully turn ⊘RV18 on the EF-12 board clockwise ↻. CHROMA KEY OUT 2  A trace formed by connecting the adjacent spots should indicate a rectangle.	⊘L1/EF-12 • Fully turn the joystick controller keeping it inclined.
	2. Background phase adjustment CHROMA KEY OUT 2  The lines connecting the adjacent spots representing chrominance signals should be orthogonal to the R-Y and B-Y axes, respectively.	⊘L2 and L3/EF-12 • Fully turn the joystick controller keeping it inclined.
	3. Background gain adjustment CHROMA KEY OUT 2  Place the joystick controller so that the lines connecting the adjacent spots representing chrominance signals are arranged orthogonal to the R-Y and B-Y axes, and set the respective spots into the specified areas on the vector scope by adjusting ⊘ RV18 on the EF-12 board.	⊘RV18/EF-12
	4. Repeat steps 1 through 3 several times.	

BACK GROUND

[For use in CRK-2000 P/PM]

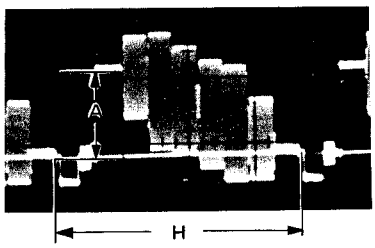
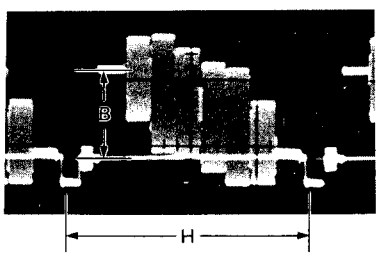
Machine condition for adjustment	Measuring point, specification, adjusting point
	1. Set the vectorscope in the NTSC mode. CHROMA KEY OUT 2  Set the PHASE adjuster at such a position that a pair of bright spots indicating the burst signal become a single bright spot.
	2. CHROMA KEY OUT 2  Set the bright spot indicating the burst signal at 75% on vector scope by adjusting both ⊘RV24 and ⊘RV25 on the EF-12 board.
	3. CHROMA KEY OUT 2  Set ⊘L1 on the EF-12 at such a position that a pair of bright spots indicating the burst signal become a single spot.
	4. Set the joystick controller to the upper left position. Fully turn ⊘RV18 on the EF-12 board clockwise. CHROMA KEY OUT 2  Set the PHASE adjuster at such a position that the bright spot is placed at 75% the vector scope. Adjust both ⊘L2 and ⊘L3 on the EF-12 board so that a pair of bright spots indicating the background color become a single spot.
	3. Background gain adjustment CHROMA KEY OUT 2  Set the bright spot onto the scale of the vector scope by adjusting ⊘RV18 on the EF-12 board when the joystick controller is set to the upper left position.
	4. Repeat steps 1 through 3 several times.

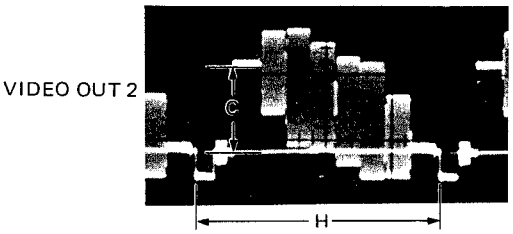
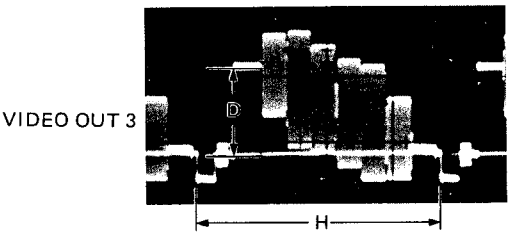
SECTION 8
VIDEO-OUT SYSTEM ADJUSTMENT



CT-41 board (Soldering Side)

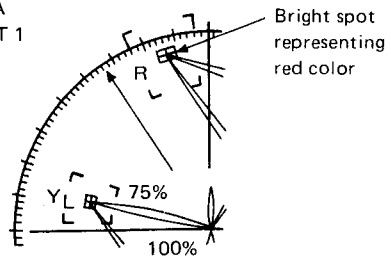
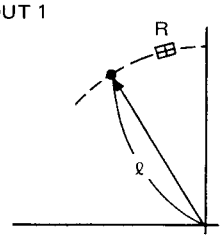
8-1. VIDEO-OUT ADJUSTMENT

Machine condition for adjustment	Measuring point and specification	Adjusting point
Mode • CAMERA PHASE INDICATION: OFF • MODE selector: LINE SEL • Remove 8 setscrews from the rear panel. • KEY bus: 1	1. Set a 75Ω terminator having a probing pin to the CHROMA KEY OUT 2 terminal.  • Measure the white level specified by "A".	EXT TRIG: HD/SG-35 or SG-34
	2. Set the 75Ω terminator having a probing pin to the VIDEO OUT 1 terminal in place of the CHROMA KEY OUT 2 terminal. VIDEO OUT 1  • Set the white level specified by "B" equal to "A" specified in item 1 by adjusting ◐RV1 on the CT-41 board.	◐RV1/CT-41 EXT TRIG: HD/SG-35 or SG-34

	3. Connect the video cable to the VIDEO IN 2 terminal in place of the VIDEO IN 1 terminal. Set the 75Ω terminator having a probing pin to the VIDEO OUT 2 terminal.  • Set the white level specified by "C" equal to "A" specified in item 1 by adjusting ⊘ RV2 on the CT-41 board.	⊘ RV2/CT-41 EXT TRIG: HD/SG-35 or SG-34
	4. Connect the video cable to the VIDEO IN 3 terminal in place of the VIDEO IN 2 terminal. Set the 75Ω terminator having a probing pin to the VIDEO OUT 3 terminal.  • Set the white level specified by "D" equal to "A" specified in item 1 by adjusting ⊘ RV3 on the CT-41 board.	⊘ RV3/CT-41 EXT TRIG: HD/SG-35 or SG-34
	5. Remove the 75Ω terminator.	

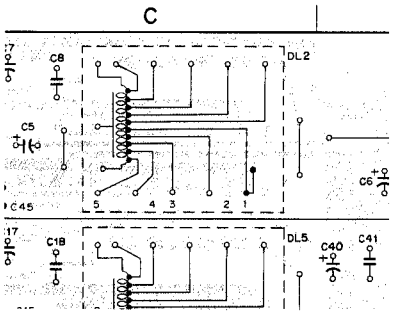
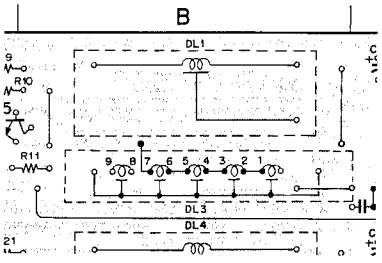
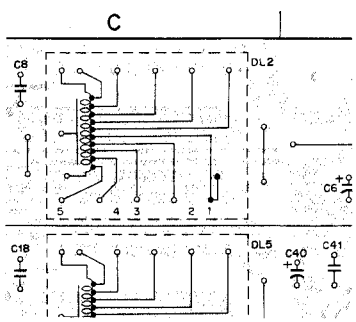
Note: After completion of adjustment specified in 8-1, the video cable should be disconnected from the VIDEO IN 3 terminal, and then it should be connected to the VIDEO IN 1 terminal.

8-2-1. VIDEO OUT 1 Adjustment-1

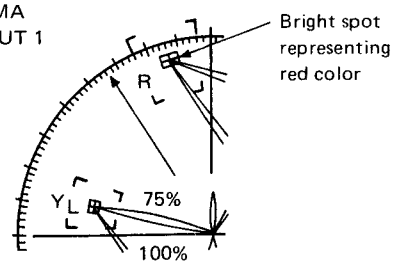
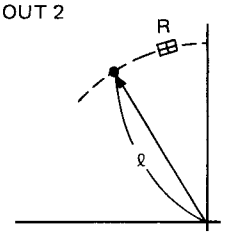
Machine condition for adjustment	Measuring point and specification	Adjusting point
	1. Vector scope setting CHROMA KEY OUT 1  Set the bright spot indicating red color at the center of the specified rectangular area by adjusting the GAIN and PHASE adjusters.	
	2. Turn off the power switch. Then, connect the vector scope to the VIDEO OUT 1 terminal in place of the CHROMA KEY OUT 1 terminal.	
	3. Turn on the power switch.	
	4. Chrominance signal level adjustment VIDEO OUT 1  • Set radius "ℓ" indicating the chrominance signal level at the center of the rectangular area specified for red color by adjusting ⊘CV1 on the CT-41 board.	⊘CV1/CT-41
	5. If any phase difference are found in item 4, perform adjustment-2 at VIDEO OUT 1.	

8-2-2. VIDEO OUT 1 Adjustment-2

Note: VIDEO OUT 1 Adjustment-1 specified in 8-2-1 should have been completed.

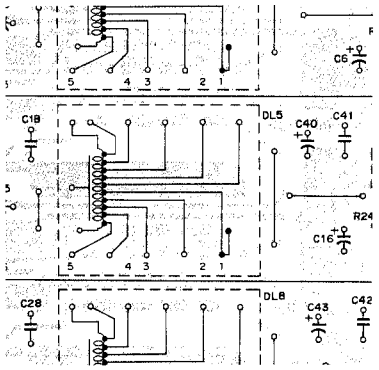
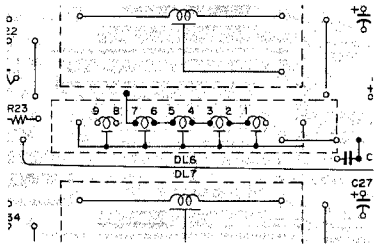
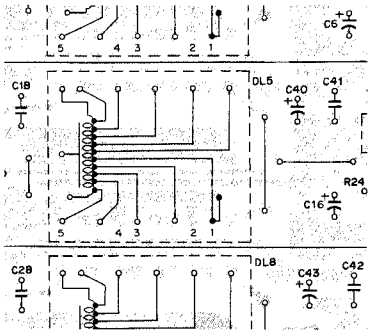
Machine condition for adjustment	Measuring point, specification, adjusting point
	1. If a phase difference of 4 to 5 degrees is found in item 4 during VIDEO OUT 1 adjustment-1 as specified in 7-18-2, perform the following operations.  1) Connecting points in DL2 on the CT-41 board should be re-soldered by the point by point method. 2) Whether VIDEO OUT 1 adjustment-1 specified in 7-18-2 is satisfactory with respect to item 4 should be confirmed.
	2. If a phase difference of more than 10 degrees is found in item 4 during VIDEO OUT 1 adjustment-1 as specified in 7-18-2, perform the following operations.  1) Connecting points in DL3 on the CT-41 board should be re-soldered by the point by point method. 2) If a phase difference of 10 degrees or more is found after accomplishment of item 1), capacitor C45 (of 10 pF) should be removed and connecting points in DL3 on the CT-41 board should be re-soldered by the point by point method. 3) If the phase difference becomes 4 to 5 degrees after accomplishment of item 2), connecting points in DL2 on the CT-41 board should be re-soldered.  4) Whether VIDEO OUT 1 adjustment-1 specified in 7-18-2 is satisfactory with respect to item 4 should be confirmed.

8-3-1. VIDEO OUT 2 Adjustment-1

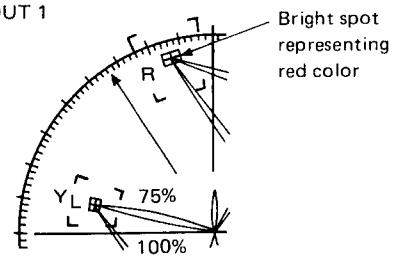
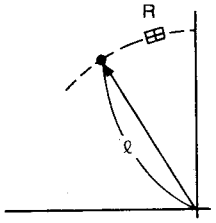
Machine condition for adjustment	Measuring point and specification	Adjusting point
	1. Vector scope setting CHROMA KEY OUT 1  Set the bright spot indicating red color at the center of the specified rectangular area by adjusting the GAIN and PHASE adjusters.	
	2. Turn off the power switch. Then, connect the vector scope to the VIDEO OUT 1 terminal in place of the CHROMA KEY OUT 1 terminal.	
	3. Turn on the power switch.	
	4. Chrominance signal level adjustment VIDEO OUT 2  • Set radius "ℓ" indicating the chrominance signal level at the center of the rectangular area specified for red color by adjusting ⊘ CV2 on the CT-41 board.	⊘ CV2/CT-41
	5. If any phase differences are found in item 4, perform adjustment-2 at VIDEO OUT 2.	

8-3-2. VIDEO OUT 2 Adjustment-2

Note: VIDEO OUT 2 Adjustment-1 specified in 8-3-1 should have been completed.

Machine condition for adjustment	Measuring point, specification, adjusting point
	1. If a phase difference of 4 to 5 degrees is found in item 4 during VIDEO OUT 2 adjustment-1 as specified in 7-18-4, perform the following operations.  1) Connecting points in DL5 on the CT-41 board should be re-soldered by the point by point method. 2) Whether VIDEO OUT 2 adjustment-1 specified in 7-18-4 is satisfactory with respect to item 4 should be confirmed.
	2. If a phase difference of 10 degrees or more is found in item 4 during VIDEO OUT 2 adjustment-1 as specified in 7-18-4, perform the following operations.  1) Connecting points in DL6 on the CT-41 board should be re-soldered by the point by point method. 2) If a phase difference of 10 degrees or more is found after accomplishment of item 1), capacitor C46 (of 10 pF) should be removed and connecting points in DL6 on the CT-41 board should be re-soldered by the point by point method. 3) If the phase difference becomes 4 to 5 degrees after accomplishment of item 2), connecting points in DL5 on the CT-41 board should be re-soldered.  4) Whether VIDEO OUT 2 adjustment-1 specified in 7-18-4 is satisfactory with respect to item 4 should be comfirmed.

8-4-1. VIDEO OUT 3 Adjustment-1

Machine condition for adjustment	Measuring point and specification	Adjusting point
	1. Vector scope setting CHROMA KEY OUT 1  Set the bright spot indicating red color at the center of the specified rectangular area by adjusting the GAIN and PHASE adjusters.	
	2. Turn off the power switch. Then, connect the vector scope to the VIDEO OUT 3 terminal in place of the CHROMA KEY OUT 1 terminal.	
	3. Turn on the power switch.	
	4. Chrominance signal level adjustment VIDEO OUT 3  • Set radius "ℓ" indicating the chrominance signal level at the center of the rectangular area specified for red color by adjusting ◐ CV3 on the CT-41 board.	◐ CV3/CT-41
	5. If any phase differences are found in item 4, perform adjustment-2 at VIDEO OUT 3 terminal.	

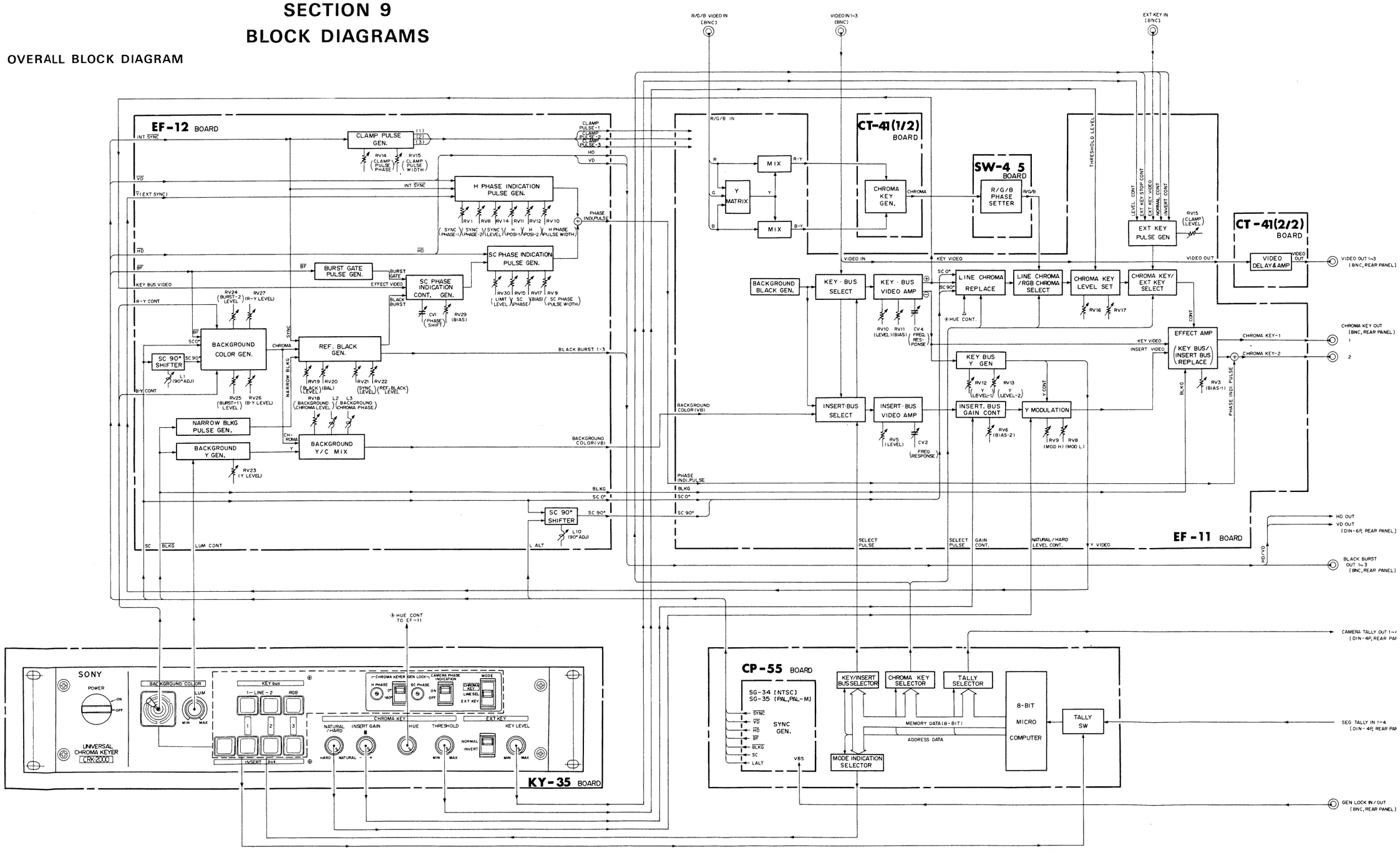
8-4-2. VIDEO OUT 3 Adjustment-2

Note: VIDEO OUT 3 Adjustment-1 specified in 8-4-1 should have been completed.

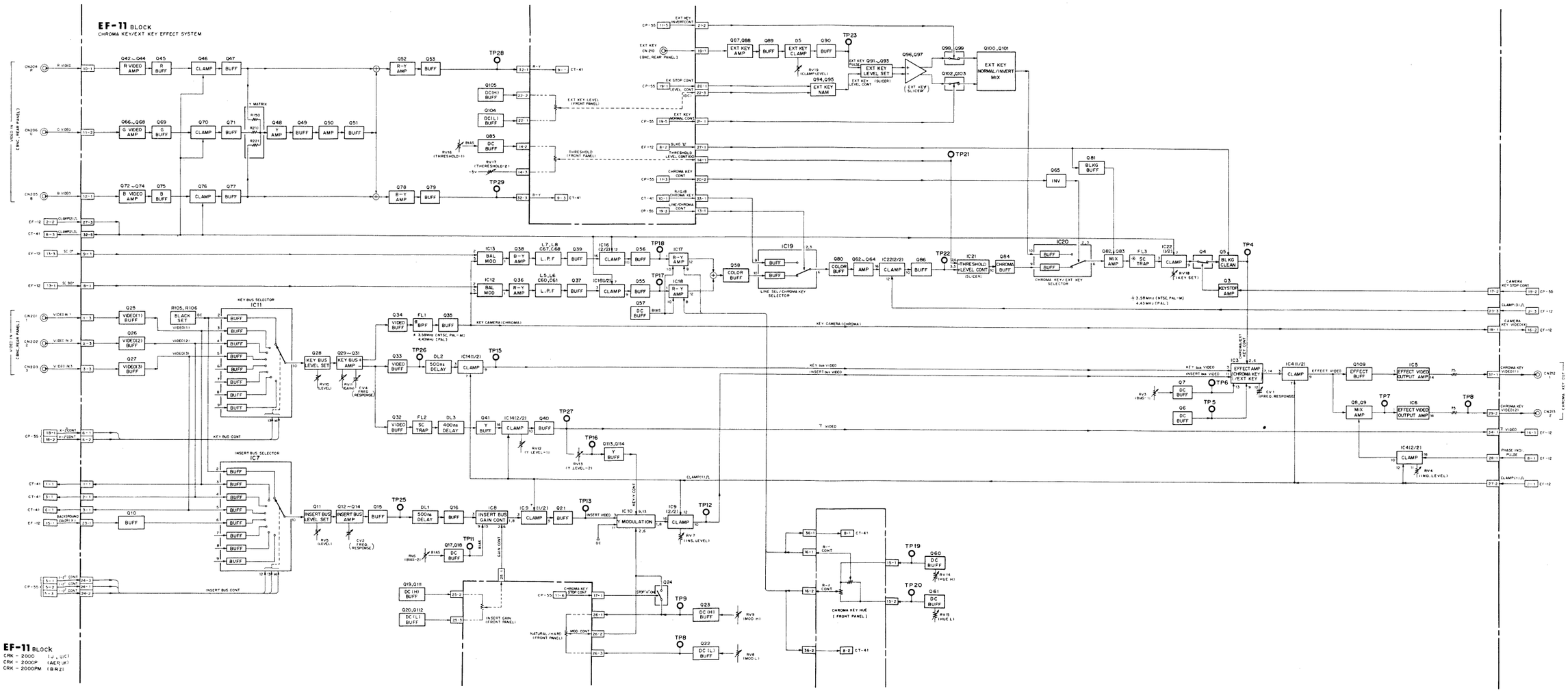
Machine condition for adjustment	Measuring point, specification, adjusting point
	1. If a phase difference of 4 to 5 degrees is found in item 4 during VIDEO OUT 3 adjustment-1 as specified in 7-18-6, perform the following operations.
	1) Connecting aoints in DL8 on the CT-41 board should be re-soldered by the point by point method. 2) Whether VIDEO OUT 3 adjustment-1 specified in 7-18-6 is satisfactory with respect the item 4 should be confirmed.
	2. If a phase difference of 10 degrees or more is found in item 4 during VIDEO OUT 3 adjustment-1 as specified in 7-18-6, perform the following operations.
	1) Connecting points in DL9 on the CT-41 board should be re-soldered by the point by point method. 2) If a phase difference of 10 degrees or more is found after accomplishment of item 1), capacitor C47 (of 10 pF) should be removed and connecting points in DL6 on the CT-41 board should be re-soldered by the point by point method. 3. If the phase difference becomes 4 to 5 degrees after accomplishment of item 2), connecting points in DL8 on the CT-41 board should be re-soldered.
	4) Whether VIDEO OUT 3 adjustment-1 specified in 7-18-6 is satisfactory with respect to item 4 should be confirmed.

SECTION 9
BLOCK DIAGRAMS

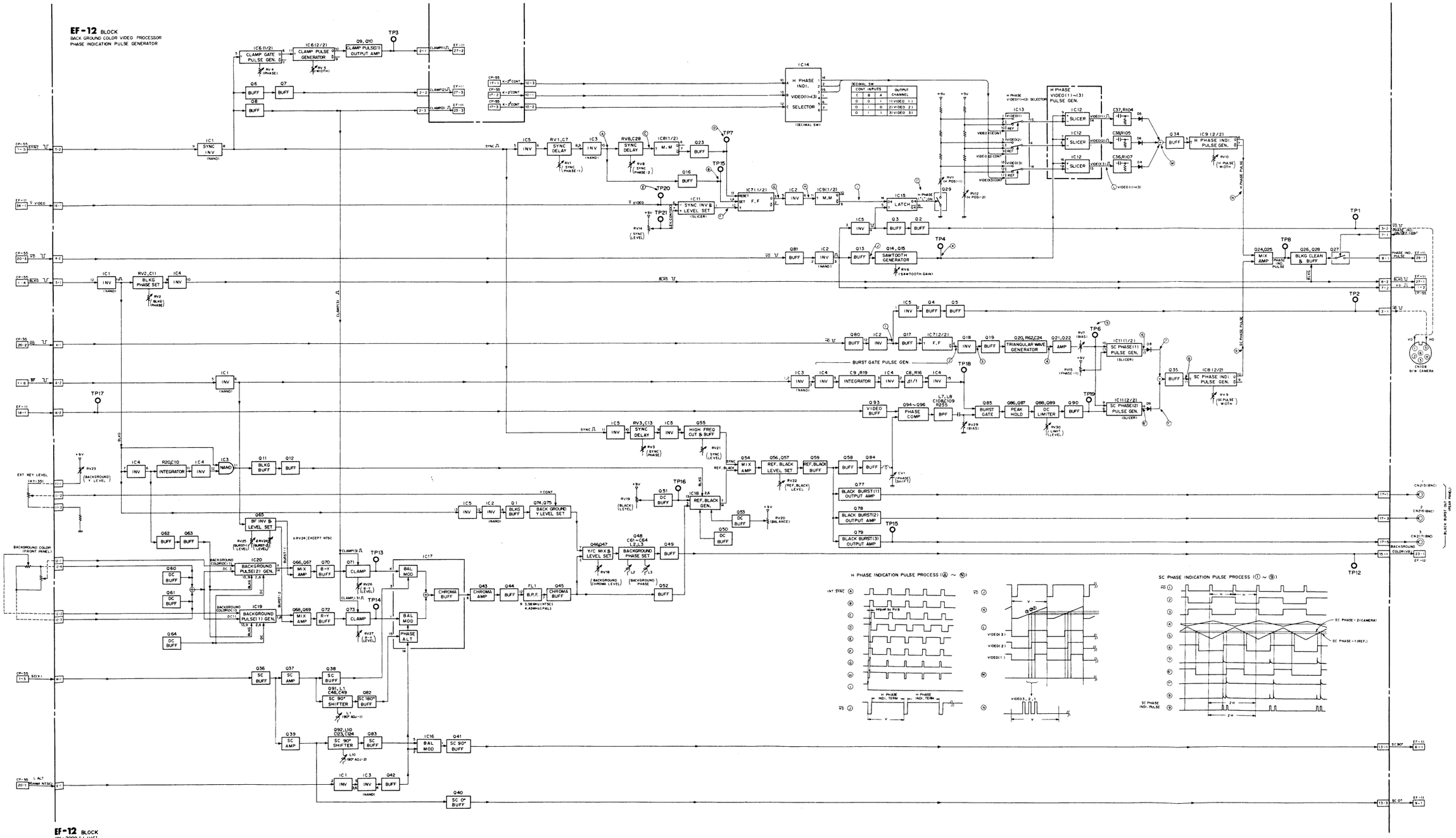
OVERALL BLOCK DIAGRAM



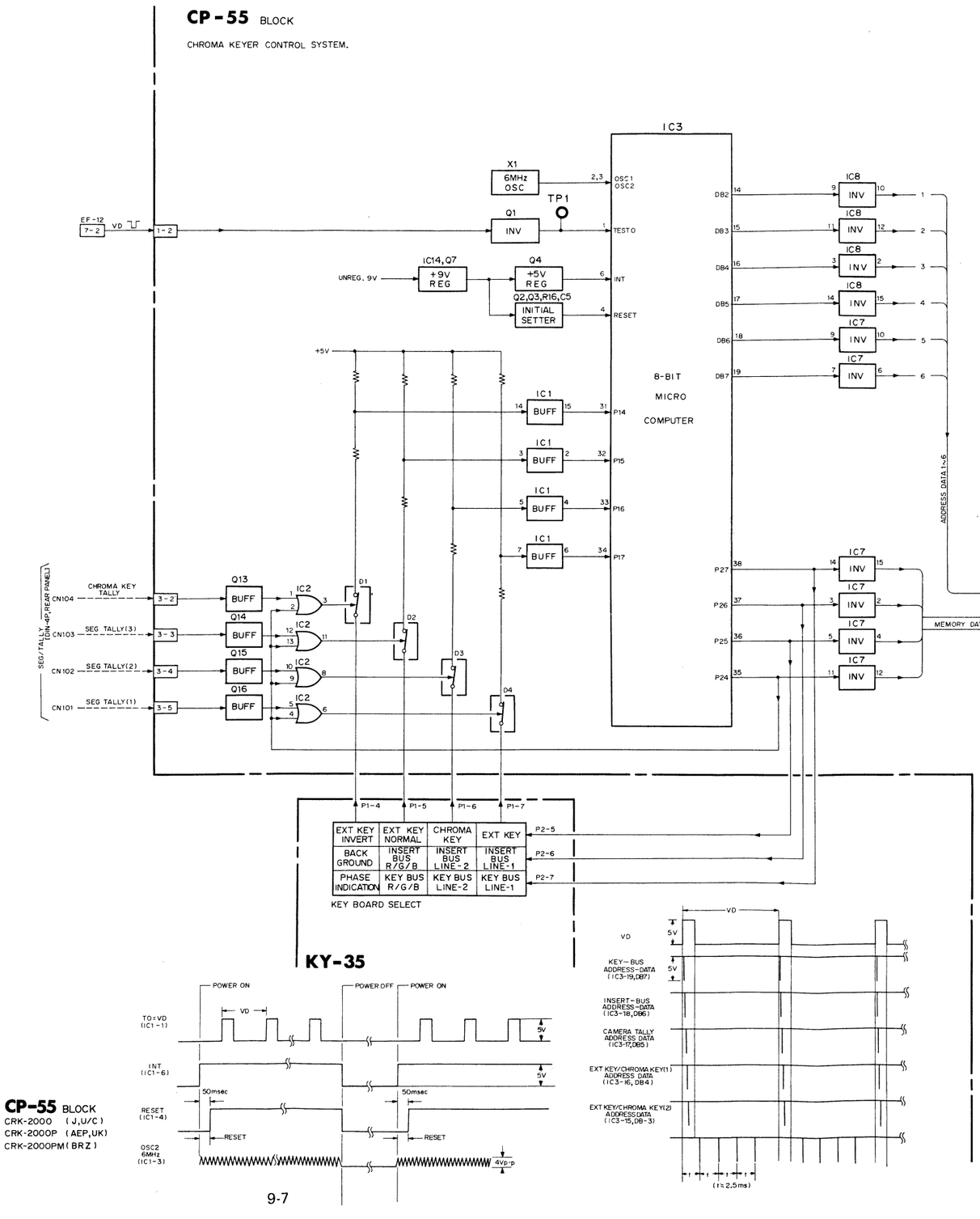
EF-11 BOARD (CHROMA KEY/EXT KEY EFFECT SYSTEM) BLOCK DIAGRAM



EF-12 BOARD (BACKGROUND COLOR VIDEO PROCESSOR, PHASE INDICATION PULSE GENERATOR) BLOCK DIAGRAM

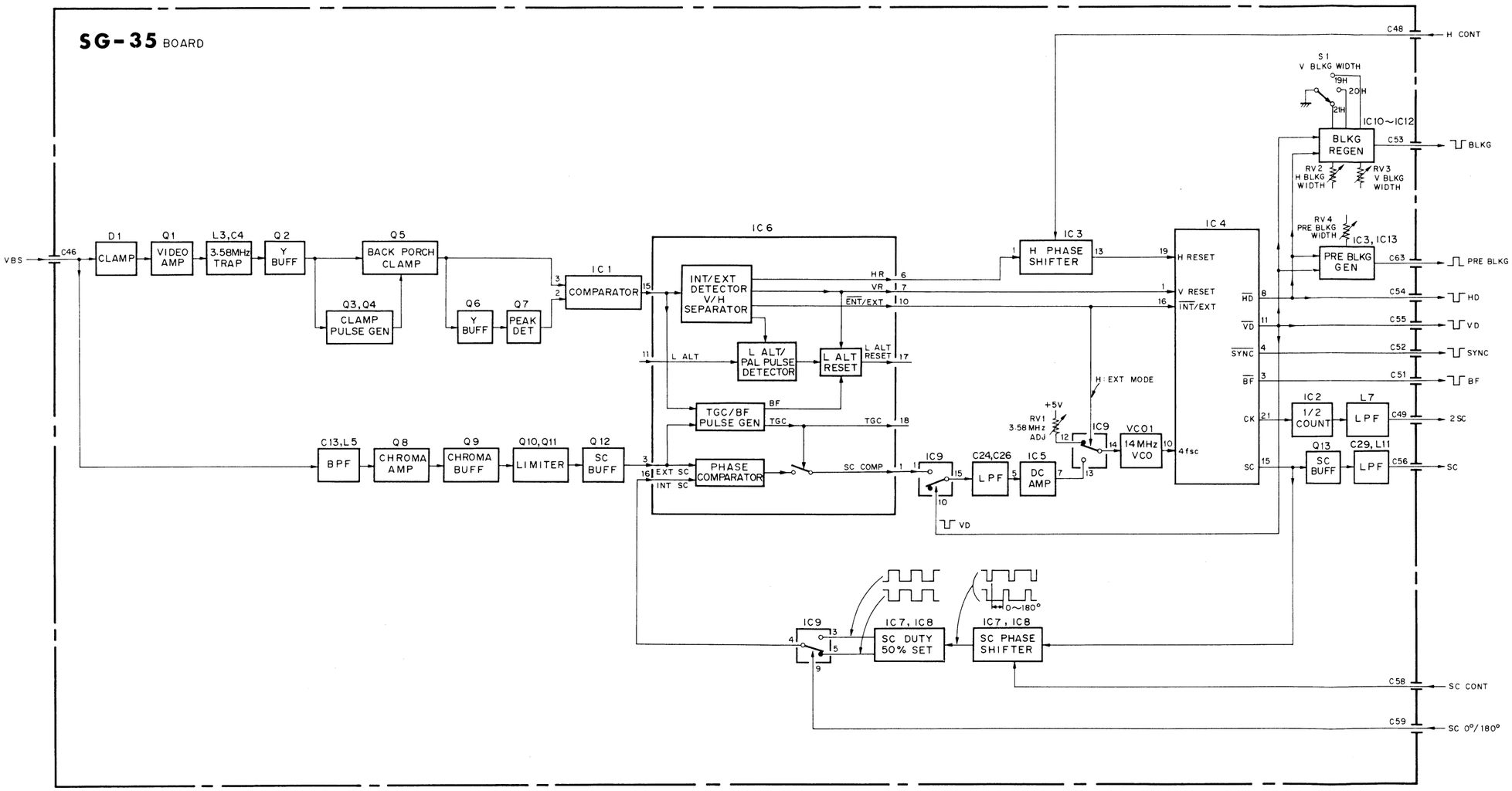


CP-55 BOARD (CHROMA KEYER CONTROL SYSTEM) BLOCK DIAGRAM

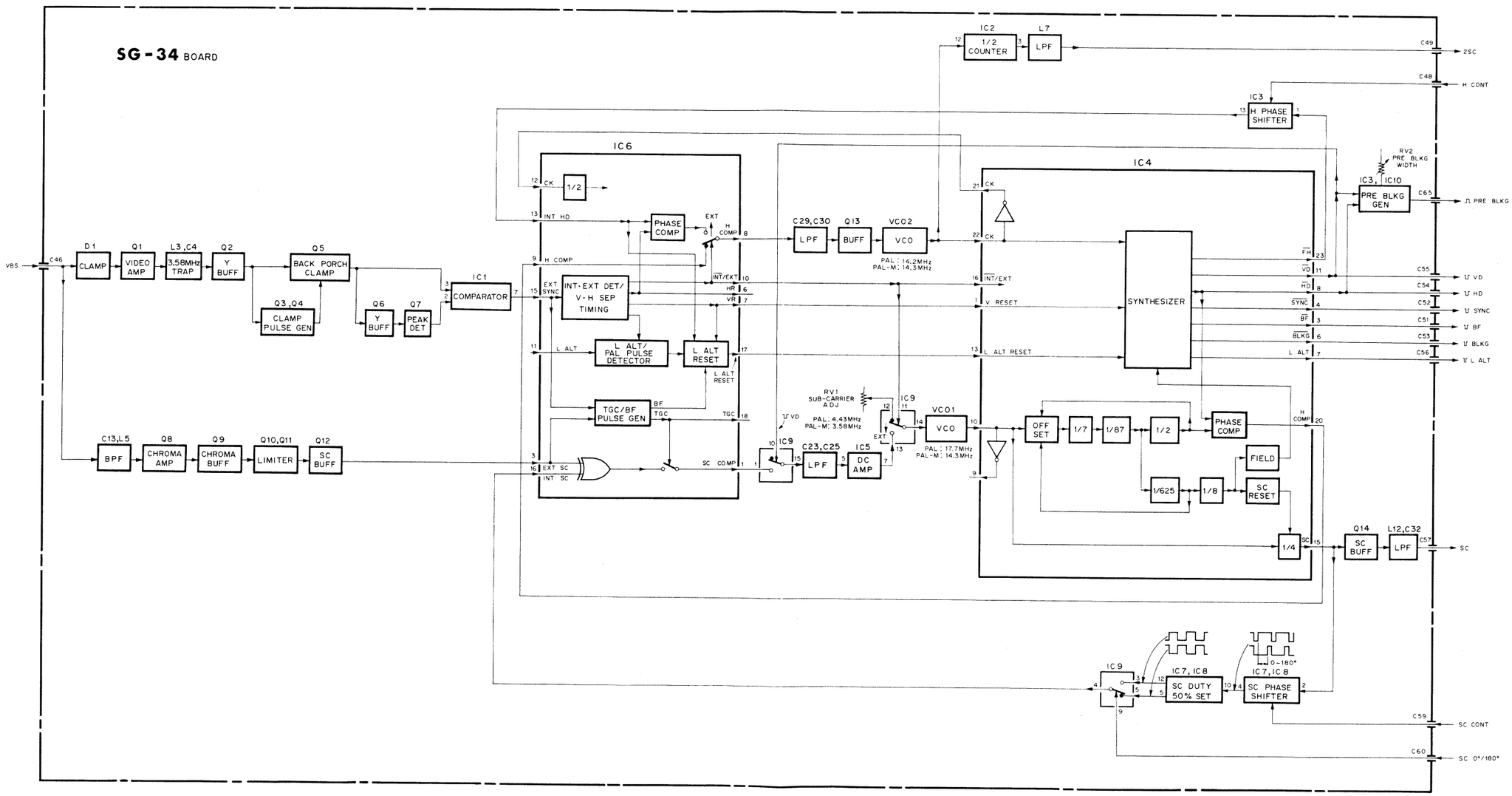


CP-55 BLOCK
CRK-2000 (J,U/C)
CRK-2000P (AEP,UK)
CRK-2000PM(BRZ)

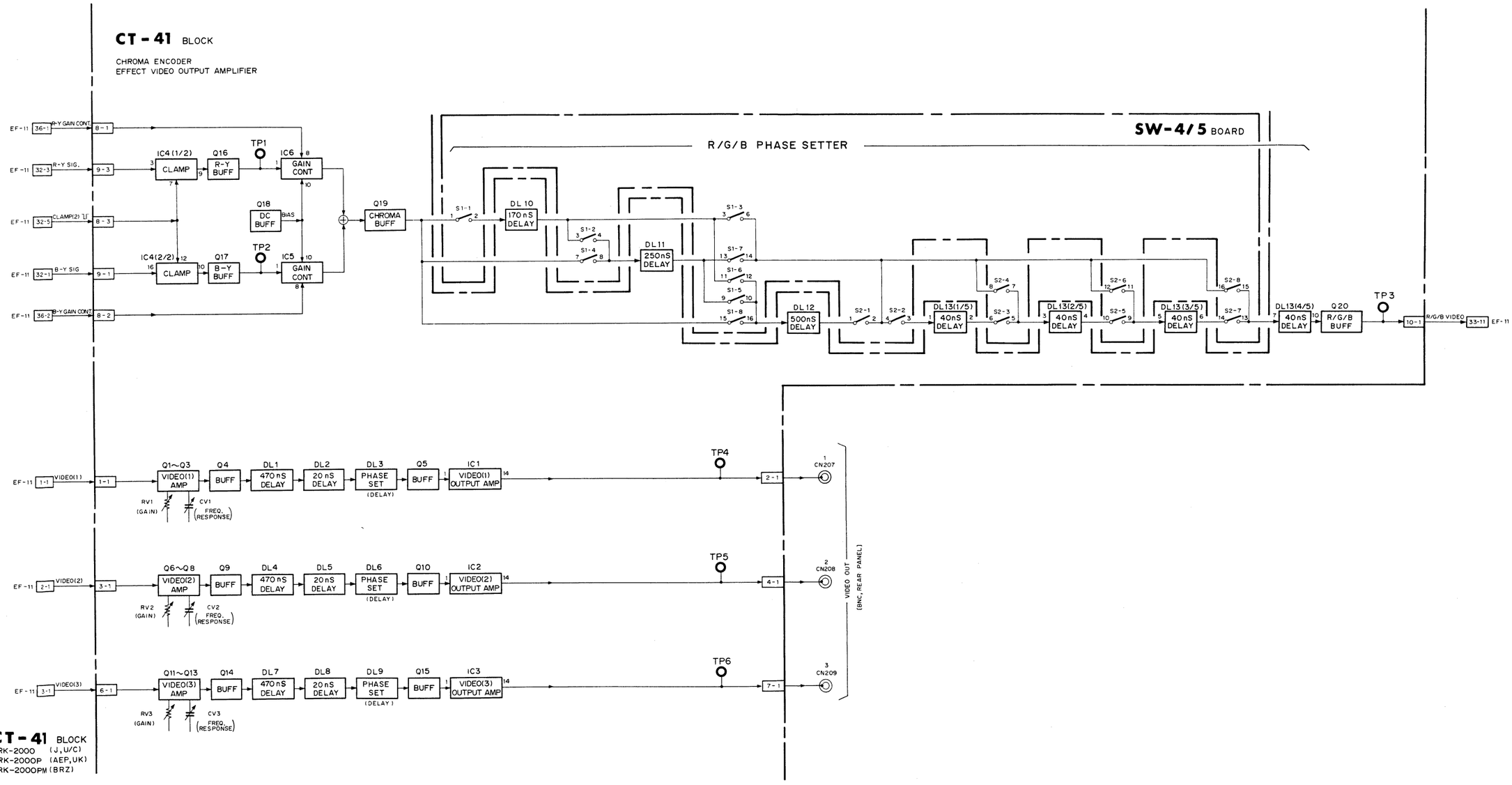
SG-35 BOARD (SYNC GENERATOR SYSTEM) BLOCK DIAGRAM
[For CRK-2000 use]



SG-34 BOARD (SYNC GENERATOR SYSTEM) BLOCK DIAGRAM
[For CRK-2000P/PM use]



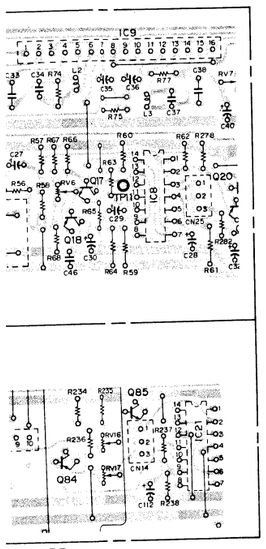
CT-41 BOARD (CHROMA ENCODER, SPECIAL EFFECT VIDEO OUTPUT SYSTEM) BLOCK DIAGRAM



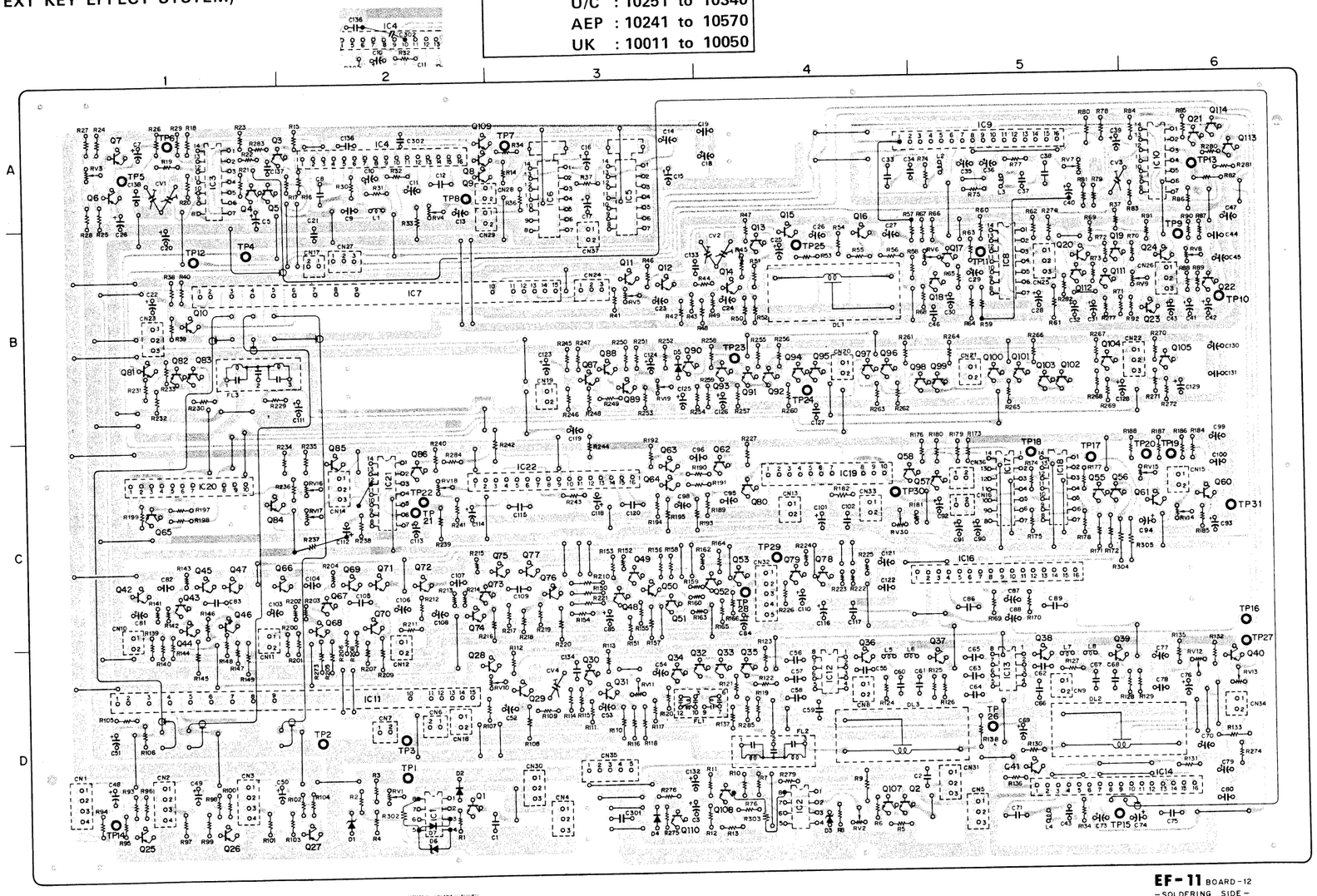
11 BOARD (CHROMA KEY/EXT KEY EFFECT SYSTEM)

'OLDERING SIDE —

Serial No.		
J	:	10141 to 10220
U/C	:	10251 to 10340
AEP	:	10241 to 10570
UK	:	10011 to 10050

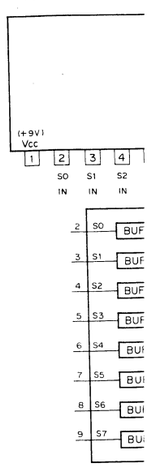


EF-11 BOARD-12
— SOLDERING SIDE —
(J) 10111 to 10140
(U/C)10201 to 10250
(AEP)10191 to 10240

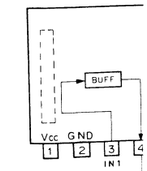


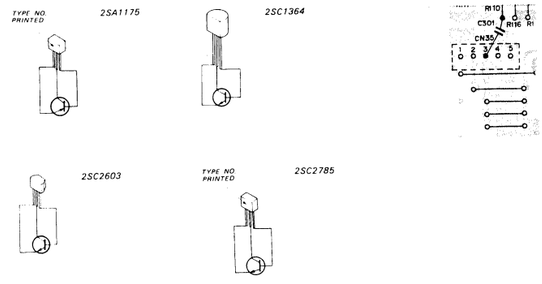
CN1	D-1	Q1	D-2	Q80	C-4	TP23	B-4
CN2	D-1	Q2	D-4	Q81	B-1	TP24	B-4
CN3	D-1	Q3	A-1	Q82	B-1	TP25	B-4
CN4	D-3	Q4	A-1	Q83	B-1	TP26	D-5
CN5	D-5	Q5	A-1	Q84	C-1	TP27	D-6
CN6	D-2	Q6	A-1	Q85	C-2	TP28	C-4
CN7	D-2	Q7	A-1	Q86	C-2	TP29	C-4
CN8	D-4	Q8	A-2	Q87	B-3	TP30	C-4
CN9	D-5	Q9	A-2	Q88	B-3	TP31	C-6
CN10	C-1	Q10	B-1	Q89	B-3		
CN11	C-1	Q11	B-3	Q90	B-3		
CN12	C-2	Q12	B-3	Q91	B-4		
CN13	C-4	Q13	B-4	Q92	B-4		
CN14	C-2	Q14	B-4	Q92	B-4		
CN15	C-6	Q15	B-4	Q93	B-4		
CN16	C-5	Q16	B-4	Q94	B-4		
CN17	B-2	Q17	B-5	Q95	B-4		
CN18	D-2	Q18	B-5	Q96	B-4		
CN19	B-3	Q19	B-5	Q97	B-4		
CN20	B-4	Q20	B-5	Q98	B-5		
CN21	B-5	Q21	A-6	Q99	B-5		
CN22	B-6	Q22	B-6	Q100	B-5		
CN23	B-1	Q23	B-6	Q101	B-5		
CN24	B-3	Q24	B-6	Q102	B-5		
CN25	B-5	Q25	D-1	Q103	B-5		
CN26	B-6	Q26	D-1	Q104	B-5		
CN27	B-2	Q27	D-2	Q105	B-6		
CN28	A-2	Q28	D-3	Q107	D-4		
CN29	A-2	Q29	D-3	Q108	D-4		
CN30	D-3	Q30	D-3	Q109	A-2		
CN31	D-5	Q31	D-3	Q110	D-3		
CN32	C-4	Q32	D-3	Q111	B-5		
CN33	C-4	Q33	D-4	Q112	B-5		
CN34	D-6	Q34	D-3	Q113	A-6		
CN35	D-3	Q35	D-4	Q114	A-6		
CN36	C-5	Q36	D-4				
CN37	B-3	Q37	D-5	RV1	D-2		
		Q38	D-5	RV2	D-4		
CV1	A-1	Q39	D-5	RV3	A-1		
CV2	B-4	Q40	D-6	RV4	A-2		
CV3	A-5	Q41	D-5	RV5	B-3		
CV4	D-3	Q42	C-1	RV6	B-5		
		Q43	C-1	RV7	A-5		
D1	D-2	Q44	C-1	RV8	B-6		
D2	D-2	Q45	C-1	RV9	B-6		
D3	D-4	Q46	C-1	RV10	D-3		
D4	D-3	Q47	C-1	RV11	D-3		
D5	B-3	Q48	C-3	RV12	D-6		
D6	D-2	Q49	C-3	RV13	D-6		
D7	D-2	Q50	C-3	RV14	C-6		
		Q51	C-3	RV15	C-6		
DL1	B-4	Q52	C-4	RV16	C-2		
DL2	D-5	Q53	C-4	RV17	C-2		
DL3	D-4	Q55	C-5	RV18	C-2		
		Q56	C-5	RV19	B-3		
IC1	D-2	Q57	C-5	RV30	C-4		
IC2	D-4	Q58	C-4				
IC3	A-1	Q60	C-6	TP1	D-2		
IC4	A-2	Q61	C-6	TP2	D-2		
IC5	A-3	Q62	C-4	TP3	D-2		
IC6	A-3	Q63	C-3	TP4	B-1		
IC7	B-2	Q64	C-3	TP5	A-1		
IC8	B-5	Q65	C-2	TP6	A-1		
IC9	A-5	Q66	C-2	TP7	A-3		
IC10	A-6	Q67	C-2	TP8	A-2		
IC11	D-1	Q68	C-2	TP9	B-6		
IC12	D-4	Q69	C-2	TP10	B-6		
IC13	D-5	Q70	C-2	TP11	B-5		
IC14	D-5	Q71	C-2	TP12	B-1		
IC16	C-5	Q72	C-2	TP13	A-6		
IC17	C-5	Q73	C-2	TP14	D-1		
IC18	C-5	Q74	C-2	TP15	D-5		
IC19	C-4	Q75	C-3	TP16	C-6		
IC20	C-1	Q76	C-3	TP17	C-5		
IC21	C-2	Q77	C-3	TP18	C-5		
IC22	C-3	Q78	C-4	TP19	C-6		
		Q79	C-4	TP20	C-6		
FL1	D-3			TP21	C-2		
FL2	D-4			TP22	C-2		
FL3	B-1						

BX3989 (SONY)
8-CHANNEL MULTIPLEXER
— REAR VIEW —

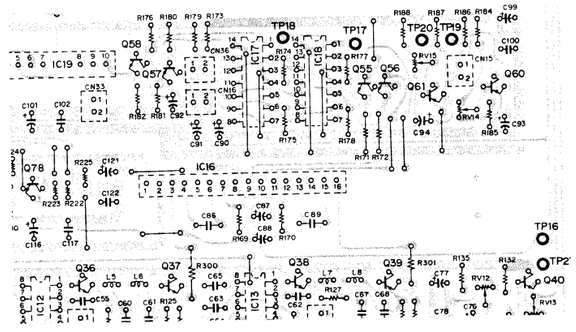


BX3992 (SONY)
DUAL CLAMPER
— REAR VIEW —





10-5(a)



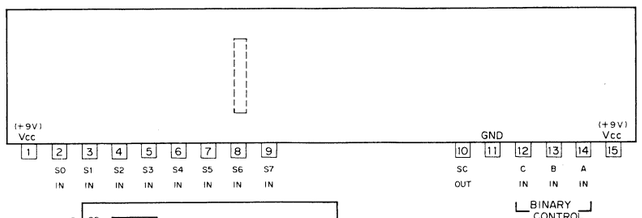
EF-11 BOARD-11
— SOLDERING SIDE —
CRK-2000(J) UP TO 10110
CRK-2000(U/C) UP TO 10200
CRK-2000P(AEP) UP TO 10190
CRK-2000P(UK) UP TO 10010
CRK-2000PM(BRZ) UP TO 10010

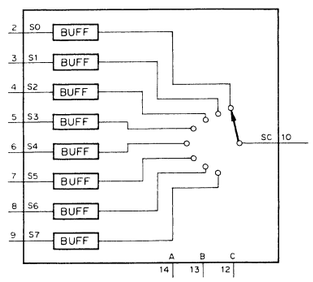
10-6(a)

EF-11 BOARD-12
— SOLDERING SIDE —
CRK-2000(J) 10141 to10220
CRK-2000(U/C) 10251to10340
CRK-2000P(AEP) 10241 to10570
CRK-2000P(UK) 10011 to10050

TP23 B - 4
TP24 B - 4
TP25 B - 4
TP26 D - 5
TP27 D - 6
TP28 C - 4
TP29 C - 4
TP30 C - 4
TP31 C - 6

BX3989 (SONY)
8-CHANNEL MULTIPLEXER WITH BUFFER
— REAR VIEW —

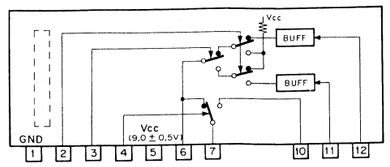




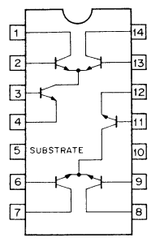
C	B	A	"ON" CHANNEL
0	0	0	0
0	0	1	1
0	1	0	2
0	1	1	3
1	0	0	4
1	0	1	5
1	1	0	6
1	1	1	7

1 ; HIGH LEVEL
0 ; LOW LEVEL

BX3990 (SONY)
2-CHANNEL SIGNAL SELECTOR
— REAR VIEW —

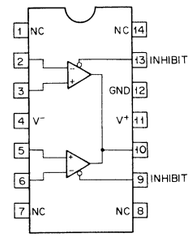


CA3054 (RCA)
DIFFERENTIAL AMPLIFIER
— TOP VIEW —

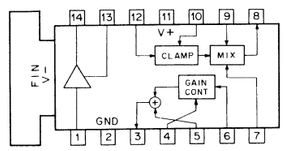


REFERENCE ; DATA BOOK OF TOSHIBA

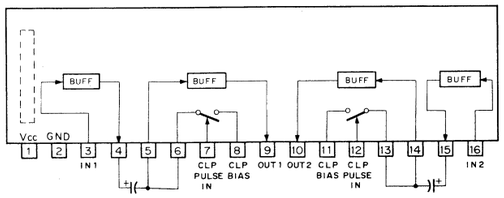
μA711CN (TI)
μA711DC (FSC)
VOLTAGE COMPARATOR
— TOP VIEW —



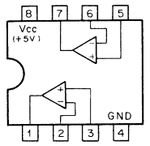
CX 814 (SONY)
— TOP VIEW —



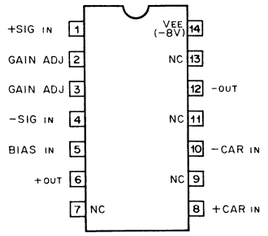
BX3992 (SONY)
DUAL CLAMPER
— REAR VIEW —

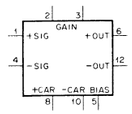


LM358JG (TI)
LM358P (TI)
μPC358C (NEC)
DUAL OPERATIONAL AMPLIFIERS
— TOP VIEW —



MC1496P (MOTOROLA)
μA796PC (FSC)
BALANCED MODULATOR/DEMODULATOR
— TOP VIEW —



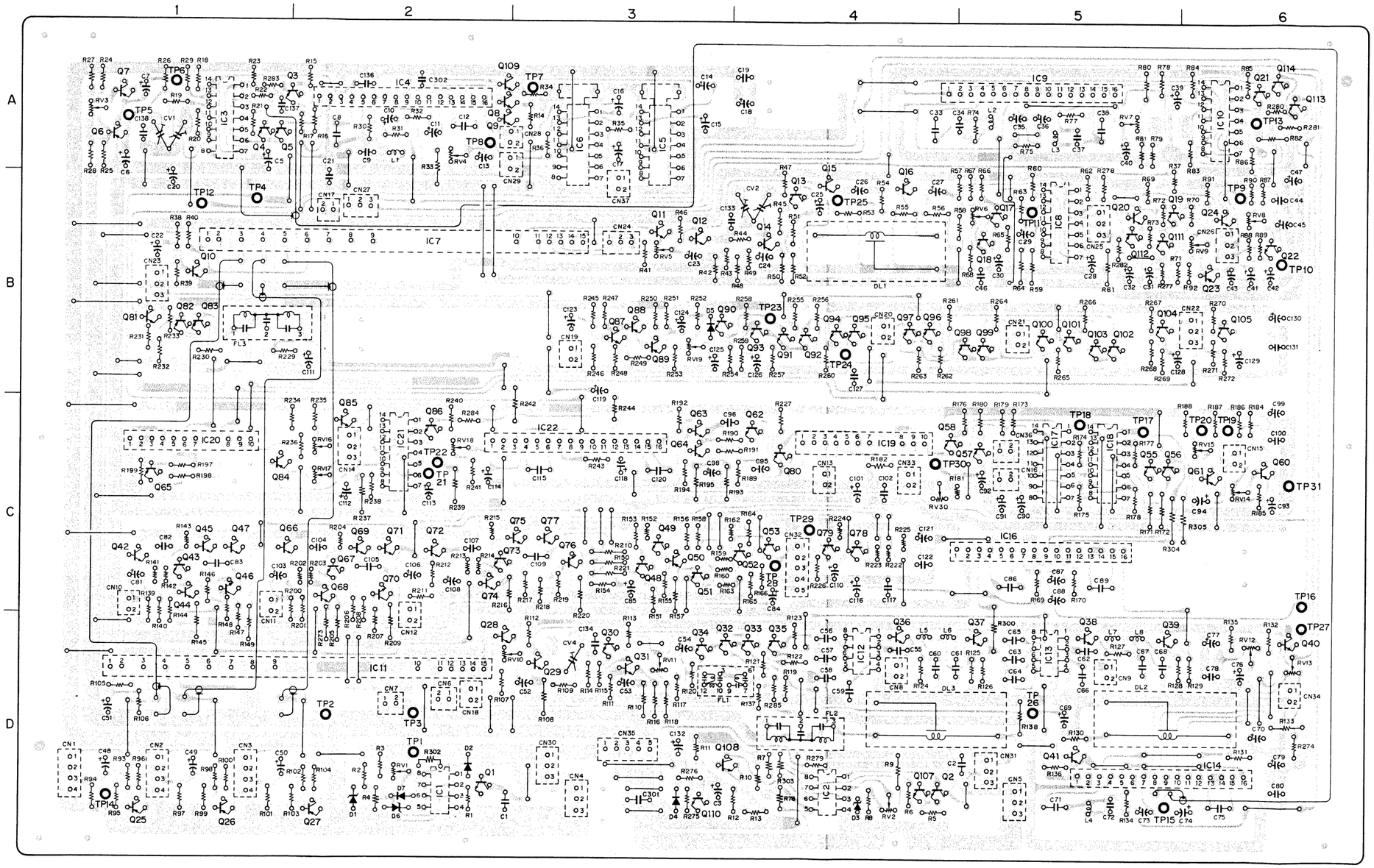


Serial No.		
	J	: 10221 and higher
	U/C	: 10341 and higher
	AEP	: 10571 and higher
	UK	: 10051 and higher
	BRZ	: 10011 and higher

EF-11 BOARD (CHROMA KEY/EXT KEY EFFECT SYSTEM)

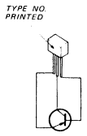
– SOLDERING SIDE –

NEW

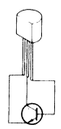


CN1	D · 1	Q1	D · 2	Q80	C · 4	TP23	B · 4
CN2	D · 1	Q2	D · 4	Q81	B · 1	TP24	B · 4
CN3	D · 1	Q3	A · 1	Q82	B · 1	TP25	B · 4
CN4	D · 3	Q4	A · 1	Q83	B · 1	TP26	D · 5
CN5	D · 5	Q5	A · 1	Q84	C · 1	TP27	D · 6
CN6	D · 2	Q6	A · 1	Q85	C · 2	TP28	C · 4
CN7	D · 2	Q7	A · 1	Q86	C · 2	TP29	C · 4
CN8	D · 4	Q8	A · 2	Q87	B · 3	TP30	C · 4
CN9	D · 5	Q9	A · 2	Q88	B · 3	TP31	C · 6
CN10	C · 1	Q10	B · 1	Q89	B · 3		
CN11	C · 1	Q11	B · 3	Q90	B · 3		
CN12	C · 2	Q12	B · 3	Q91	B · 4		
CN13	C · 4	Q13	B · 4	Q92	B · 4		
CN14	C · 2	Q14	B · 4	Q92	B · 4		
CN15	C · 6	Q15	B · 4	Q93	B · 4		
CN16	C · 5	Q16	B · 4	Q94	B · 4		
CN17	B · 2	Q17	B · 5	Q95	B · 4		
CN18	D · 2	Q18	B · 5	Q96	B · 4		
CN19	B · 3	Q19	B · 5	Q97	B · 4		
CN20	B · 4	Q20	B · 5	Q98	B · 5		
CN21	B · 5	Q21	A · 6	Q99	B · 5		
CN22	B · 6	Q22	B · 6	Q100	B · 5		
CN23	B · 1	Q23	B · 6	Q101	B · 5		
CN24	B · 3	Q24	B · 6	Q102	B · 5		
CN25	B · 5	Q25	D · 1	Q103	B · 5		
CN26	B · 6	Q26	D · 1	Q104	B · 5		
CN27	B · 2	Q27	D · 2	Q105	B · 6		
CN28	A · 2	Q28	D · 3	Q107	D · 4		
CN29	A · 2	Q29	D · 3	Q108	D · 4		
CN30	D · 3	Q30	D · 3	Q109	A · 2		
CN31	D · 5	Q31	D · 3	Q110	D · 3		
CN32	C · 4	Q32	D · 3	Q111	B · 5		
CN33	C · 4	Q33	D · 4	Q112	B · 5		
CN34	D · 6	Q34	D · 3	Q113	A · 6		
CN35	D · 3	Q35	D · 4	Q114	A · 6		
CN36	C · 5	Q36	D · 4				
CN37	B · 3	Q37	D · 5	RV1	D · 2		
		Q38	D · 5	RV2	D · 4		
CV1	A · 1	Q39	D · 5	RV3	A · 1		
CV2	B · 4	Q40	D · 6	RV4	A · 2		
CV3	A · 5	Q41	D · 5	RV5	B · 3		
CV4	D · 3	Q42	C · 1	RV6	B · 5		
		Q43	C · 1	RV7	A · 5		
D1	D · 2	Q44	C · 1	RV8	B · 6		
D2	D · 2	Q45	C · 1	RV9	B · 6		
D3	D · 4	Q46	C · 1	RV10	D · 3		
D4	D · 3	Q47	C · 1	RV11	D · 3		
D5	B · 3	Q48	C · 3	RV12	D · 6		
D6	D · 2	Q49	C · 3	RV13	D · 6		
D7	D · 2	Q50	C · 3	RV14	C · 6		
		Q51	C · 3	RV15	C · 6		
DL1	B · 4	Q52	C · 4	RV16	C · 2		
DL2	D · 5	Q53	C · 4	RV17	C · 2		
DL3	D · 4	Q55	C · 5	RV18	C · 2		
		Q56	C · 5	RV19	B · 3		
IC1	D · 2	Q57	C · 5	RV30	C · 4		
IC2	D · 4	Q58	C · 4				
IC3	A · 1	Q60	C · 6	TP1	D · 2		
IC4	A · 2	Q61	C · 6	TP2	D · 2		
IC5	A · 3	Q62	C · 4	TP3	D · 2		
IC6	A · 3	Q63	C · 3	TP4	B · 1		
IC7	B · 2	Q64	C · 3	TP5	A · 1		
IC8	B · 5	Q65	C · 1	TP6	A · 1		
IC9	A · 5	Q66	C · 2	TP7	A · 3		
IC10	A · 6	Q67	C · 2	TP8	A · 2		
IC11	D · 1	Q68	C · 2	TP9	B · 6		
IC12	D · 4	Q69	C · 2	TP10	B · 6		
IC13	D · 5	Q70	C · 2	TP11	B · 5		
IC14	D · 5	Q71	C · 2	TP12	B · 1		
IC16	C · 5	Q72	C · 2	TP13	A · 6		
IC17	C · 5	Q73	C · 2	TP14	D · 1		
IC18	C · 5	Q74	C · 2	TP15	D · 5		
IC19	C · 4	Q75	C · 3	TP16	C · 6		
IC20	C · 1	Q76	C · 3	TP17	C · 5		
IC21	C · 2	Q77	C · 3	TP18	C · 5		
IC22	C · 3	Q78	C · 4	TP19	C · 6		
FL1	D · 3	Q79	C · 4	TP20	C · 6		
FL2	D · 4			TP21	C · 2		
FL3	B · 1			TP22	C · 2		

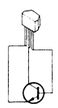
TYPE NO. PRINTED 2SA1175



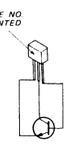
2SC1364



2SC2603



TYPE NO. PRINTED 2SC2785

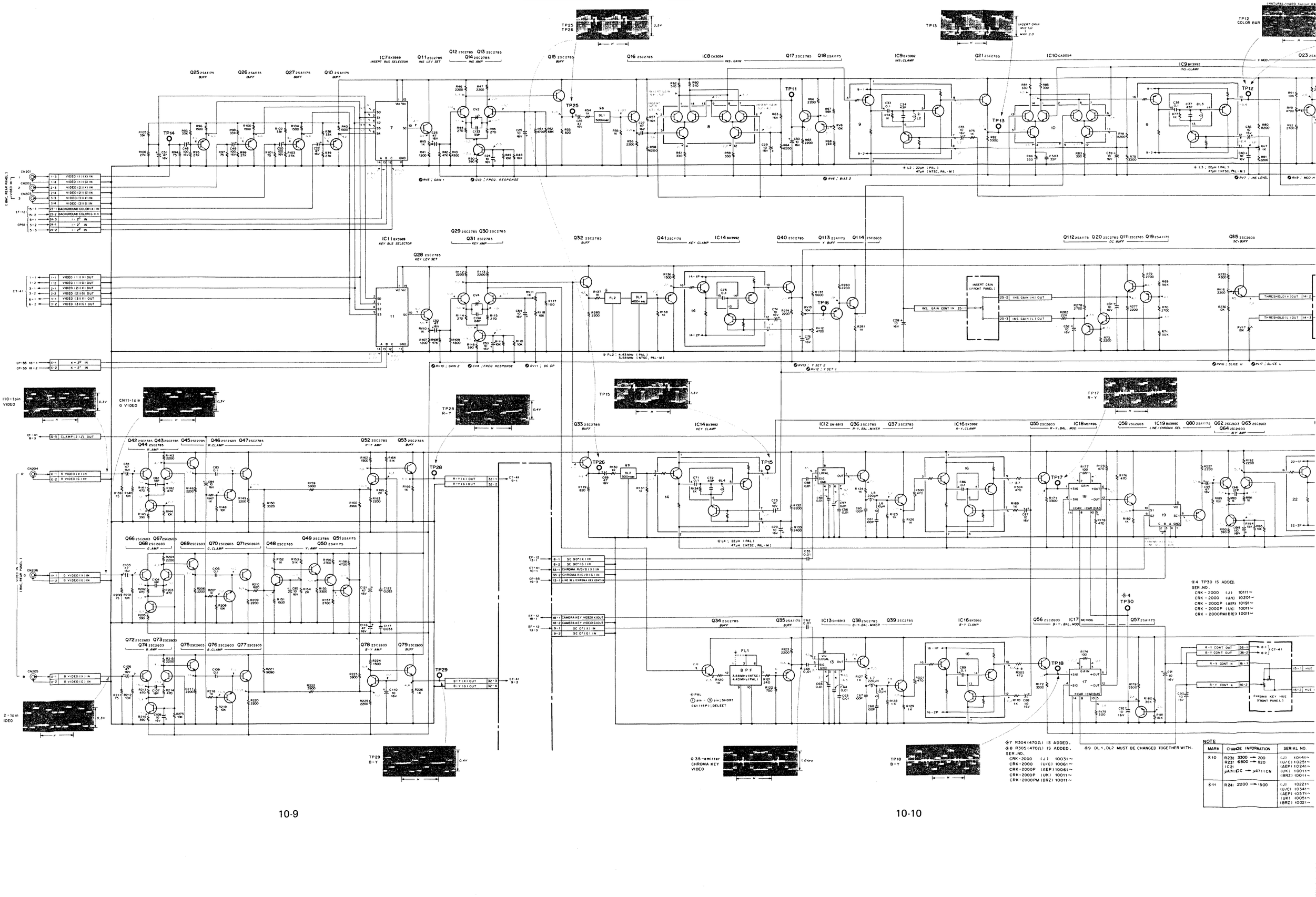


EF-11 BOARD-13

– SOLDERING SIDE –

CRK-2000(J)	10221 ~
CRK-2000(U/C)	10341 ~
CRK-2000P(AEP)	10571 ~
CRK-2000P(UK)	10051 ~
CRK-2000PM(BRZ)	10011 ~

EF-11 BOARD (CHROMA KEY/EXT KEY EFFECT SYSTEM)



※4 TP30 IS ADDED.
SER.NO.
CRK-2000 (J) 10111~
CRK-2000 (U/C) 10201~
CRK-2000P (AEP) 10191~
CRK-2000P (UK) 10011~
CRK-2000PM(BRZ) 10011~

※7 R304(470Ω) IS ADDED.
※8 R305(470Ω) IS ADDED.
SER.NO.
CRK-2000 (J) 10031~
CRK-2000 (U/C) 10061~
CRK-2000P (AEP) 10061~
CRK-2000P (UK) 10011~
CRK-2000PM(BRZ) 10011~

※9 DL1,DL2 MUST BE CHANGED TOGETHER WITH.

NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
※10	R238 3300 → 200 R237 6800 → 820 IC21 μA741DC → μA711CN	(J) 10141~ (U/C) 10251~ (AEP) 10241~ (UK) 10011~ (BRZ) 10011~
※11	R241 2200 → 1500	(J) 10221~ (U/C) 10341~ (AEP) 10571~ (UK) 10051~ (BRZ) 10021~

※6 TP31 IS ADDED.
SER.NO.
CRK-2000 (J) 10111~
CRK-2000 (U/C) 10201~
CRK-2000P (AEP) 10191~
CRK-2000P (UK) 10011~
CRK-2000PM(BRZ) 10011~

※1 R303 IS ADDED
※2 R302,D6,D7 ARE ADDED
※3 R261 470Ω → 330Ω
SER.NO.
CRK-2000 (U/C,J) 10021~
CRK-2000P (AEP,UK) 10001~
CRK-2000PM(BRZ) 10001~

SERIAL NO.
(J) UP to 10140
(U/C) UP to 10250
(AEP) UP to 10240
(UK) UP to 10010
(BRZ) UP to 10010

※4 TP30 IS ADDED.
SER.NO.
CRK-2000 (J) 10111~
CRK-2000 (U/C) 10201~
CRK-2000P (AEP) 10191~
CRK-2000P (UK) 10011~
CRK-2000PM(BRZ) 10011~

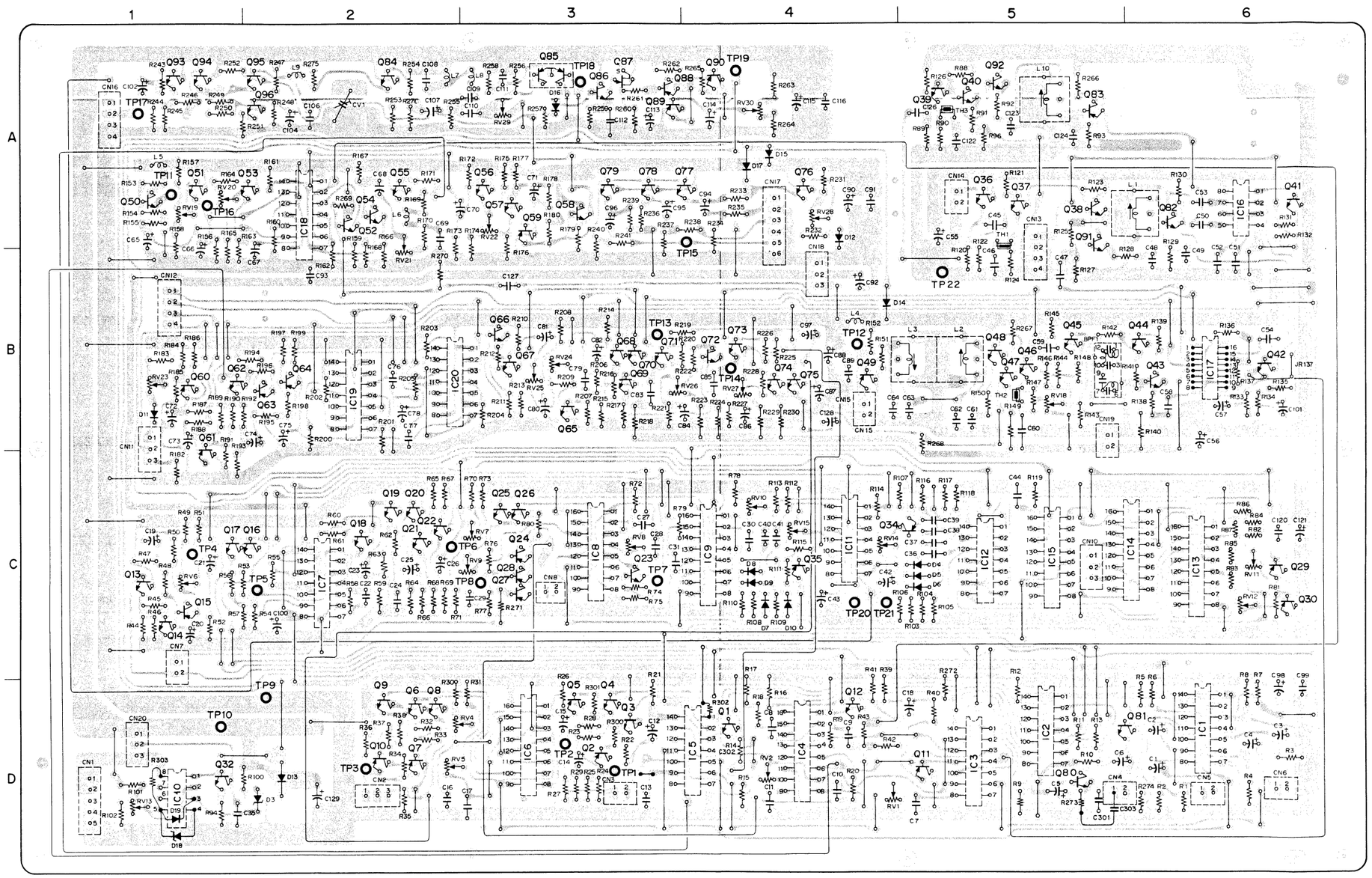
NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
※10	R238 3300 → 200 R237 6800 → 820 IC21 μA711DC → μA711CN	(J) 10141~ (U/C) 10251~ (AEP) 10241~ (UK) 10011~ (BRZ) 10011~
※11	R241 2200 → 1500	(J) 10221~ (U/C) 10341~ (AEP) 10571~ (UK) 10051~ (BRZ) 10021~

Serial No.		
J	:	10111 to 10220
U/C	:	10201 to 10340
AEP	:	10191 to 10570
UK	:	10011 to 10050

EF-12 BOARD (BACKGROUND COLOR VIDEO PROCESSOR, PHASE INDICATION PULSE GENERATOR)

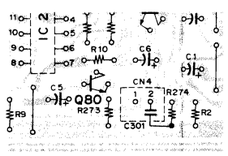
— SOLDERING SIDE —

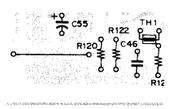


CN1	D · 1	Q25	C · 3	RV14	C · 4
CN2	D · 2	Q26	C · 3	RV15	C · 4
CN3	D · 3	Q27	C · 3	RV18	B · 5
CN4	D · 4	Q28	C · 3	RV19	A · 1
CN5	D · 6	Q29	C · 6	RV20	A · 1
CN6	D · 6	Q30	C · 6	RV21	B · 2
CN7	C · 1	Q32	D · 1	RV22	A · 3
CN8	C · 3	Q34	C · 5	RV23	B · 1
CN10	C · 5	Q35	C · 4	RV24	B · 3
CN11	B · 1	Q36	A · 5	RV25	B · 3
CN12	B · 1	Q37	A · 5	RV26	B · 3
CN13	A · 5	Q38	A · 5	RV27	B · 4
CN14	A · 5	Q39	A · 5	RV28	A · 4
CN15	B · 4	Q40	A · 5	RV29	A · 3
CN16	A · 1	Q41	A · 6	RV30	A · 4
CN17	A · 4	Q42	B · 6		
CN18	B · 4	Q43	B · 6	TP1	D · 3
CN19	B · 5	Q44	B · 6	TP2	D · 3
CN20	D · 1	Q45	B · 5	TP3	D · 2
		Q46	B · 5	TP4	C · 1
CV1	A · 2	Q47	B · 5	TP5	C · 2
		Q48	B · 5	TP6	C · 2
D3	D · 2	Q49	B · 4	TP7	C · 3
D4	C · 5	Q50	A · 1	TP8	C · 3
D5	C · 5	Q51	A · 1	TP9	D · 2
D6	C · 5	Q52	A · 2	TP10	D · 1
D7	C · 4	Q53	A · 2	TP11	A · 1
D8	C · 4	Q54	A · 2	TP12	B · 4
D9	C · 4	Q55	A · 2	TP13	B · 3
D10	C · 4	Q56	A · 3	TP14	B · 4
D11	B · 1	Q57	A · 3	TP15	A · 4
D12	A · 4	Q58	A · 3	TP16	A · 1
D13	D · 2	Q59	A · 3	TP17	A · 1
D14	B · 4	Q60	B · 1	TP18	A · 3
D15	A · 4	Q61	B · 1	TP19	A · 4
D16	A · 3	Q62	B · 2	TP20	C · 4
D17	A · 4	Q63	B · 2	TP21	C · 4
D18	D · 1	Q64	B · 3	TP22	B · 5
D19	D · 1	Q65	B · 3		
		Q66	B · 3		
IC1	D · 6	Q67	B · 3		
IC2	D · 5	Q68	B · 3		
IC3	D · 5	Q69	B · 3		
IC4	D · 4	Q70	B · 3		
IC5	D · 4	Q71	B · 3		
IC6	D · 3	Q72	B · 4		
IC7	C · 2	Q73	B · 4		
IC8	C · 3	Q74	B · 4		
IC9	C · 4	Q75	B · 4		
IC10	D · 1	Q76	A · 4		
IC11	C · 4	Q77	A · 4		
IC12	C · 5	Q78	A · 3		
IC13	C · 6	Q79	A · 3		
IC14	C · 6	Q80	D · 5		
IC15	C · 5	Q81	D · 6		
IC16	A · 6	Q82	A · 6		
IC17	B · 6	Q83	A · 5		
IC18	A · 2	Q84	A · 2		
IC19	B · 2	Q85	A · 3		
IC20	B · 2	Q86	A · 3		
		Q87	A · 3		
Q1	D · 4	Q88	A · 3		
Q2	D · 3	Q89	A · 3		
Q3	D · 3	Q90	A · 4		
Q4	D · 3	Q91	A · 5		
Q5	D · 3	Q92	A · 5		
Q6	D · 2	Q93	A · 1		
Q7	D · 2	Q94	A · 1		
Q8	D · 2	Q95	A · 2		
Q9	D · 2	Q96	A · 2		
Q10	D · 2				
Q11	D · 5	RV1	D · 4		
Q12	D · 4	RV2	D · 4		
Q13	C · 1	RV4	D · 2		
Q14	C · 1	RV5	D · 2		
Q15	C · 1	RV6	C · 1		
Q16	C · 2	RV7	C · 3		
Q17	C · 1	RV8	C · 3		
Q18	C · 2	RV9	C · 3		
Q19	C · 2	RV10	C · 4		
Q20	C · 2	RV11	C · 6		
Q21	C · 2	RV12	C · 6		
Q22	C · 2	RV13	D · 1		
Q23	C · 3				
Q24	C · 3				

EF-12 BOARD –12
— SOLDERING SIDE —

CRK-2000(J)	10111~10220
CRK-2000(U/C)	10201~10340
CRK-2000P(AEP)	10191~10570
CRK-2000P(UK)	10011~10050





EF-12 BOARD-11
— SOLDERING SIDE—

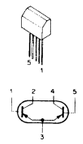
CRK-2000(J)	UP TO 10110
CRK-2000(U/C)	UP TO 10200
CRK-2000P(AEP)	UP TO 10190
CRK-2000P(UK)	UP TO 10010
CRK-2000PM(BRZ)	UP TO 10010

Q25	C · 3
Q26	C · 3
Q27	C · 3
Q28	C · 3
Q29	C · 6
Q30	C · 6
Q32	D · 1
Q34	C · 5
Q35	C · 4
Q36	A · 5
Q37	A · 5
Q38	A · 5
Q39	A · 5
Q40	A · 5
Q41	A · 6
Q42	B · 6
Q43	B · 6
Q44	B · 6
Q45	B · 5
Q46	B · 5
Q47	B · 5
Q48	B · 5
Q49	B · 4
Q50	A · 1
Q51	A · 1
Q52	A · 2
Q53	A · 2
Q54	A · 2
Q55	A · 2
Q56	A · 3
Q57	A · 3
Q58	A · 3
Q59	A · 3
Q60	B · 1
Q62	B · 1
Q63	B · 2
Q64	B · 2
Q65	B · 3
Q66	B · 3
Q67	B · 3
Q68	B · 3
Q69	B · 3
Q70	B · 3
Q71	B · 3
Q72	B · 4
Q73	B · 4
Q74	B · 4
Q75	B · 4
Q76	A · 4
Q77	A · 4
Q78	A · 3
Q79	A · 3
Q80	D · 5
Q81	D · 6
Q82	A · 6
Q83	A · 5
Q84	A · 2
Q85	A · 3
Q86	A · 3
Q87	A · 3
Q88	A · 3
Q89	A · 4
Q90	A · 5
Q91	A · 1
Q92	A · 1
Q93	A · 2
Q95	A · 2
Q101	D · 4
Q102	D · 4
Q104	D · 2
Q105	D · 2
Q106	C · 1
Q107	C · 3
Q108	C · 3
Q109	C · 3
Q110	C · 4
Q111	C · 6
Q112	C · 6
Q113	D · 1

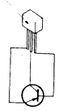
RV14	C · 4
RV15	C · 4
RV18	B · 5
RV19	A · 1
RV20	A · 1
RV21	B · 2
RV22	A · 3
RV23	B · 1
RV24	B · 3
RV25	B · 3
RV26	B · 3
RV27	B · 4
RV28	A · 4
RV29	A · 3
RV30	A · 4

TP1	D · 3
TP2	D · 3
TP3	D · 2
TP4	C · 1
TP5	C · 2
TP6	C · 2
TP7	C · 3
TP8	C · 3
TP9	D · 2
TP10	D · 1
TP11	A · 1
TP12	B · 4
TP13	B · 3
TP14	B · 4
TP15	A · 4
TP16	A · 1
TP17	A · 1
TP18	A · 3
TP19	A · 4
TP20	C · 4
TP21	C · 4
TP22	B · 5

2SA979

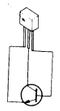


TYPE NO PRINTED 2SA1175



2SC1364

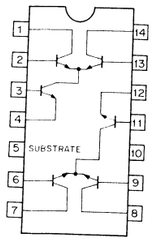
TYPE NO PRINTED 2SC2785



2SD774

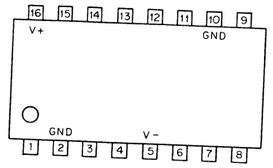
2SK43

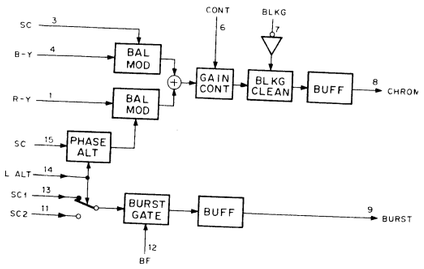
CA3054 (RCA)
DIFFERENTIAL AMPLIFIER
— TOP VIEW —



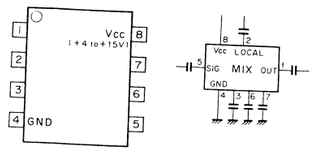
REFERENCE ; DATA BOOK OF TOSHIBA

CX22017 (SONY)
VIDEO SIGNAL PROCESSOR
— TOP VIEW —

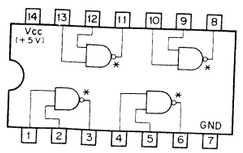


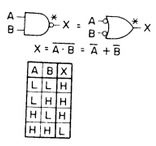


SN16913P (TI)
BALANCED MIXER
— TOP VIEW —



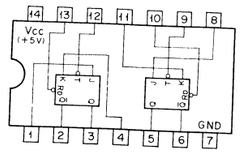
SN74LS26N (TI)
TTL 2-INPUT NAND GATE WITH OPEN-COLLECTOR
— TOP VIEW —





A	B	X
L	L	H
L	H	H
H	L	H
H	H	L

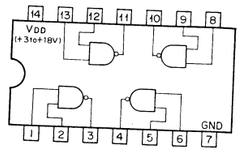
SN74LS107AN (TI)
TTL J-K FLIP FLOP WITH DIRECT RESET
— TOP VIEW —

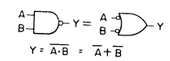


INPUTS				OUT
RD	T	J	K	Qn+1
0	X	X	X	0
1	↓	0	0	Qn
1	↓	0	1	0
1	↓	1	0	1
1	↓	1	1	$\overline{Qn}$
1	1	X	X	Qn

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

TC4011BP (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —

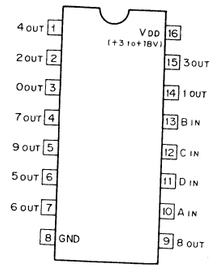


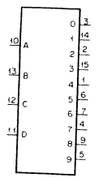


A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0; LOW LEVEL
1; HIGH LEVEL

TC4028BP (TOSHIBA)
C-MOS BCD TO DECIMAL DECODER
— TOP VIEW —

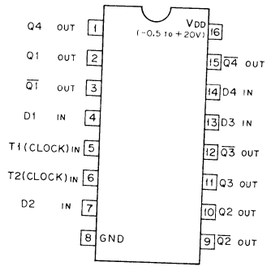


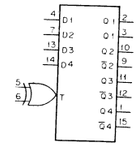


STATE	INPUTS				OUTPUTS									
	D	C	B	A	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
1	0	0	0	1	0	1	0	0	0	0	0	0	0	0
2	0	0	1	0	0	0	1	0	0	0	0	0	0	0
3	0	0	1	1	0	0	0	1	0	0	0	0	0	0
4	0	1	0	0	0	0	0	0	1	0	0	0	0	0
5	0	1	0	1	0	0	0	0	0	1	0	0	0	0
6	0	1	1	0	0	0	0	0	0	0	1	0	0	0
7	0	1	1	1	0	0	0	0	0	0	0	1	0	0
8	1	X	X	0	0	0	0	0	0	0	0	0	1	0
9	1	X	X	1	0	0	0	0	0	0	0	0	0	1

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

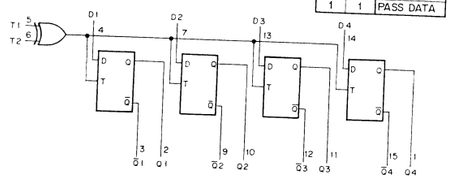
TC4042BP (TOSHIBA)
C-MOS D-TYPE LATCH
— TOP VIEW —



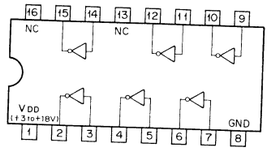


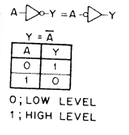
FUNCTION TABLE

T1	T2	Q / $\overline{Q}$
0	0	PASS DATA
0	1	LATCH DATA
1	0	LATCH DATA
1	1	PASS DATA



TC4049BP (TOSHIBA)
C-MOS INVERTING TYPE BUFFER/CONVERTER
— TOP VIEW —

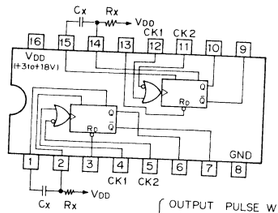




A	Y
0	1
1	0

0; LOW LEVEL
1; HIGH LEVEL

TC4528BP (TOSHIBA)
C-MOS RETRIGGERABLE/RESETTABLE MMV
— TOP VIEW —

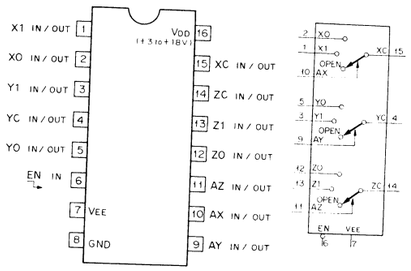


INPUTS			OUTPUTS	
CK1	CK2	RD	Q	$\overline{Q}$
↓	↑	1	⎍	⎍
↓	0	1	0	1
1	↓	1	0	1
0	↓	1	⎍	⎍
X	X	0	0	1

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

OUTPUT PULSE WIDTH Q OR $\overline{Q}$
• (FOR Cx ≧ 0.01μF USE FORMULA)
PW = 0.2 · Rx · Cx · ℓn (VDD − GND)
• (FOR Cx < 0.01μF USE DATA BOOK.)

TC4053BP (TOSHIBA)
C-MOS 2-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —



0; LOW LEVEL
1, HIGH LEVEL
X, DON'T CARE.

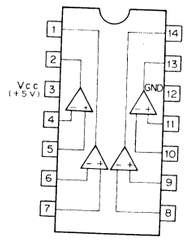
CONT. INPUTS		ON
EN	A (X,Y,Z)	CHANNEL
0	0	0
0	1	1
1	X	OPEN

TC4069UBP (TOSHIBA)
C-MOS INVERTER
— TOP VIEW —

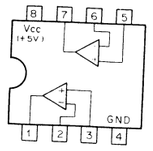
A	Y
0	1
1	0

0; LOW LEVEL
1; HIGH LEVEL

uPC339C (NEC)
COMPARATOR
— TOP VIEW —



uPC358C (NEC)
DUAL OPERATIONAL AMPLIFIERS
— TOP VIEW —

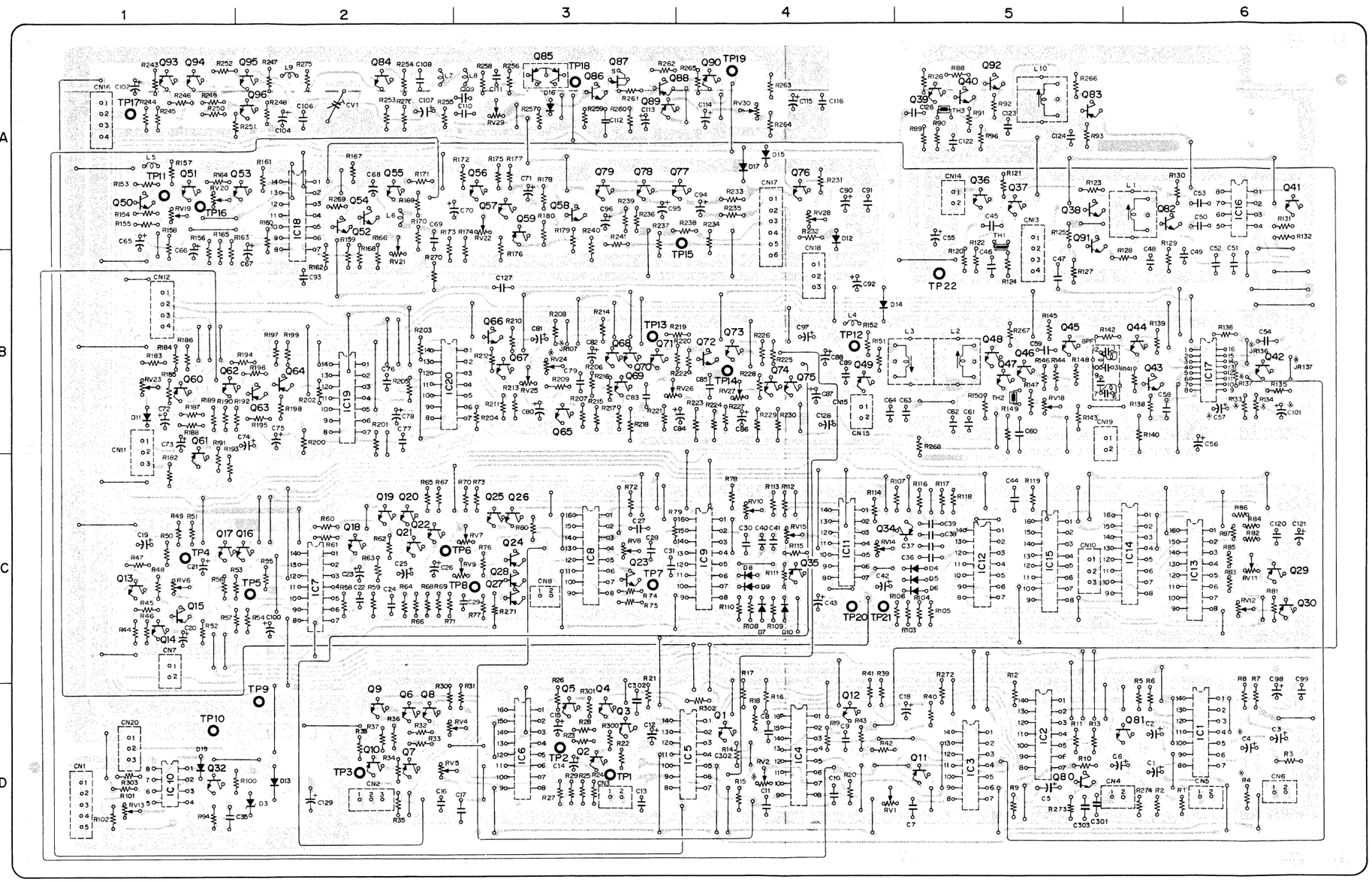


Serial No.		
J	: 10221	and higher
U/C	: 10341	and higher
AEP	: 10571	and higher
UK	: 10051	and higher
BRZ	: 10011	and higher

EF-12 BOARD (BACKGROUND COLOR VIDEO PROCESSOR, PHASE INDICATICATION PULSE GENERATOR)

– SOLDERING SIDE –

NEW



CN1	D - 1	Q25	C - 3	RV14	C - 4
CN2	D - 2	Q26	C - 3	RV15	C - 4
CN3	D - 3	Q27	C - 3	RV18	B - 5
CN4	D - 4	Q28	C - 3	RV19	A - 1
CN5	D - 6	Q29	C - 6	RV20	A - 1
CN6	D - 6	Q30	C - 6	RV21	B - 2
CN7	C - 1	Q32	D - 1	RV22	A - 3
CN8	C - 3	Q34	C - 5	RV23	B - 1
CN10	C - 5	Q35	C - 4	RV24	B - 3
CN11	B - 1	Q36	A - 5	RV25	B - 3
CN12	B - 1	Q37	A - 5	RV26	B - 3
CN13	A - 5	Q38	A - 5	RV27	B - 4
CN14	A - 5	Q39	A - 5	RV28	A - 4
CN15	B - 4	Q40	A - 5	RV29	A - 3
CN16	A - 1	Q41	A - 6	RV30	A - 4
CN17	A - 4	Q42	B - 6		
CN18	B - 4	Q43	B - 6	TP1	D - 3
CN19	B - 5	Q44	B - 6	TP2	D - 3
CN20	D - 1	Q45	B - 5	TP3	D - 2
		Q46	B - 5	TP4	C - 1
CV1	A - 2	Q47	B - 5	TP5	C - 2
		Q48	B - 5	TP6	C - 2
D3	D - 2	Q49	B - 4	TP7	C - 3
D4	C - 5	Q50	A - 1	TP8	C - 3
D5	C - 5	Q51	A - 1	TP9	D - 2
D6	C - 5	Q52	A - 2	TP10	D - 1
D7	C - 4	Q53	A - 2	TP11	A - 1
D8	C - 4	Q54	A - 2	TP12	B - 4
D9	C - 4	Q55	A - 2	TP13	B - 3
D10	C - 4	Q56	A - 3	TP14	B - 4
D11	B - 1	Q57	A - 3	TP15	A - 4
D12	A - 4	Q58	A - 3	TP16	A - 1
D13	D - 2	Q59	A - 3	TP17	A - 1
D14	B - 4	Q60	B - 1	TP18	A - 3
D15	A - 4	Q61	B - 1	TP19	A - 4
D16	A - 3	Q62	B - 2	TP20	C - 4
D17	A - 4	Q63	B - 2	TP21	C - 4
D18	D - 1	Q64	B - 3	TP22	B - 5
D19	D - 1	Q65	B - 3		
		Q66	B - 3		
IC1	D - 6	Q67	B - 3		
IC2	D - 5	Q68	B - 3		
IC3	D - 5	Q69	B - 3		
IC4	D - 4	Q70	B - 3		
IC5	D - 4	Q71	B - 3		
IC6	D - 3	Q72	B - 4		
IC7	C - 2	Q73	B - 4		
IC8	C - 3	Q74	B - 4		
IC9	C - 4	Q75	B - 4		
IC10	D - 1	Q76	A - 4		
IC11	C - 4	Q77	A - 4		
IC12	C - 5	Q78	A - 3		
IC13	C - 6	Q79	A - 3		
IC14	C - 6	Q80	D - 5		
IC15	C - 5	Q81	D - 6		
IC16	A - 6	Q82	A - 6		
IC17	B - 6	Q83	A - 5		
IC18	A - 2	Q84	A - 2		
IC19	B - 2	Q85	A - 3		
IC20	B - 2	Q86	A - 3		
		Q87	A - 3		
		Q88	A - 3		
Q1	D - 4	Q89	A - 3		
Q2	D - 3	Q90	A - 4		
Q3	D - 3	Q91	A - 5		
Q4	D - 3	Q92	A - 5		
Q5	D - 3	Q93	A - 1		
Q6	D - 2	Q94	A - 1		
Q7	D - 2	Q95	A - 2		
Q8	D - 2	Q96	A - 2		
Q9	D - 2				
Q10	D - 2	RV1	D - 4		
Q11	D - 5	RV2	D - 4		
Q12	D - 4	RV3	D - 3		
Q13	C - 1	RV4	D - 2		
Q14	C - 1	RV5	D - 2		
Q15	C - 1	RV6	C - 1		
Q16	C - 2	RV7	C - 3		
Q17	C - 1	RV8	C - 3		
Q18	C - 2	RV9	C - 3		
Q19	C - 2	RV10	C - 4		
Q20	C - 2	RV11	C - 6		
Q21	C - 2	RV12	C - 6		
Q22	C - 2	RV13	D - 1		
Q23	C - 3				
Q24	C - 3				

EF-12 BOARD –13

— SOLDERING SIDE —

CRK – 2000 (J) 10221 ~

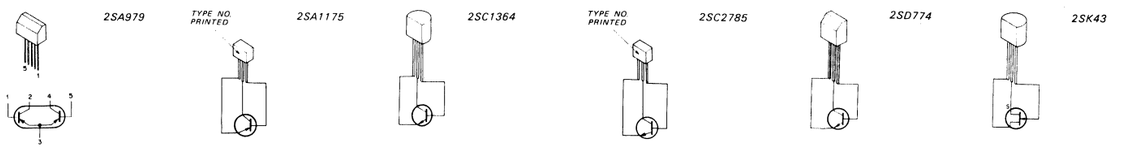
CRK – 2000 (U/C) 10341 ~

CRK – 2000P (AEP) 10571 ~

CRK – 2000P (UK) 10051 ~

CRK – 2000PM (BRZ) 10011 ~

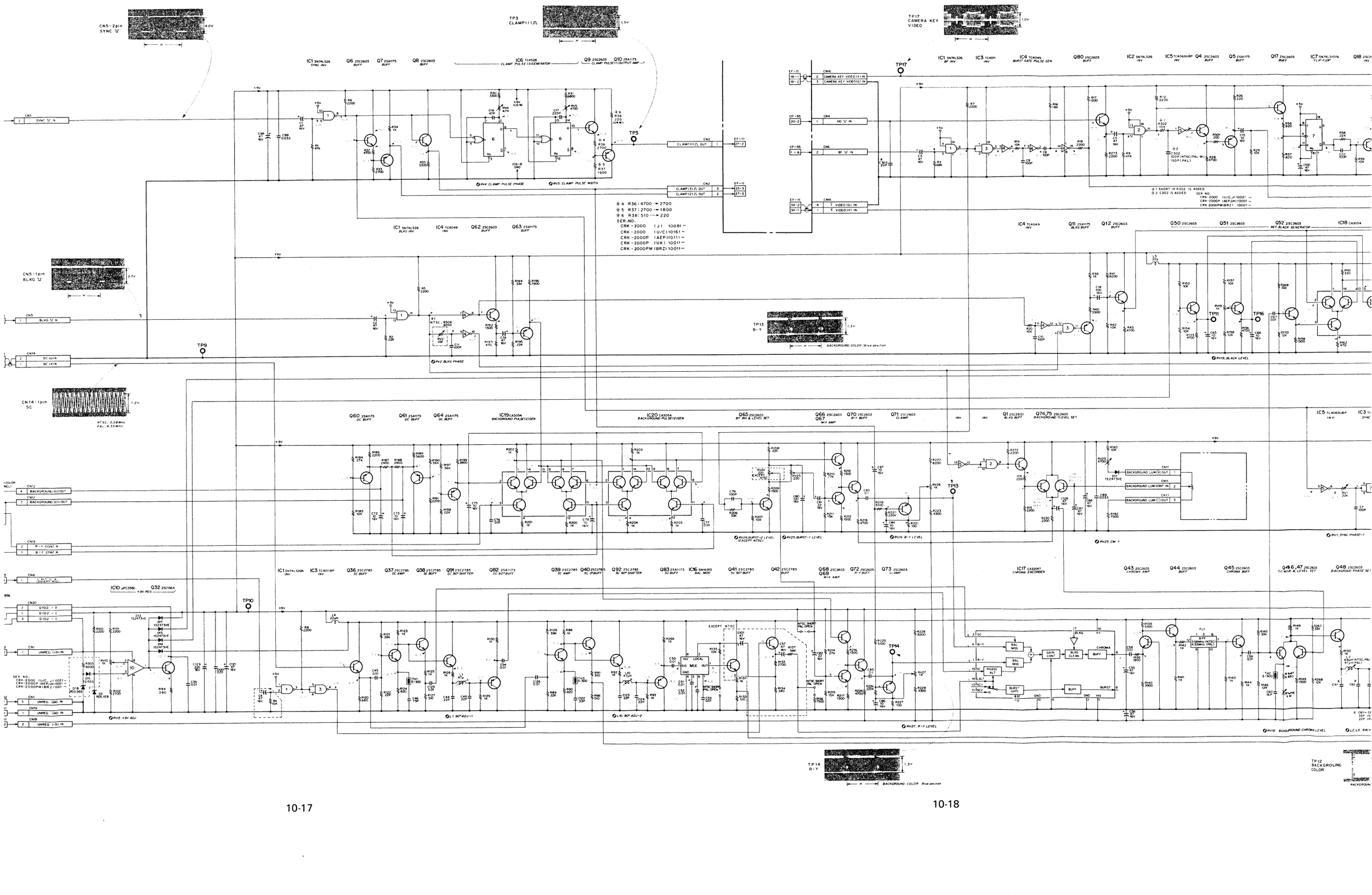
※	NTSC	PAL
JR107 JR136 JR137	SHORT	OPEN
C4	–	C4
C57	–	C57
C101	–	C101
R4	–	R4
R133	–	R133
R134	–	R134
R137	–	R137
RV2	R304	RV2
RV24	–	RV24

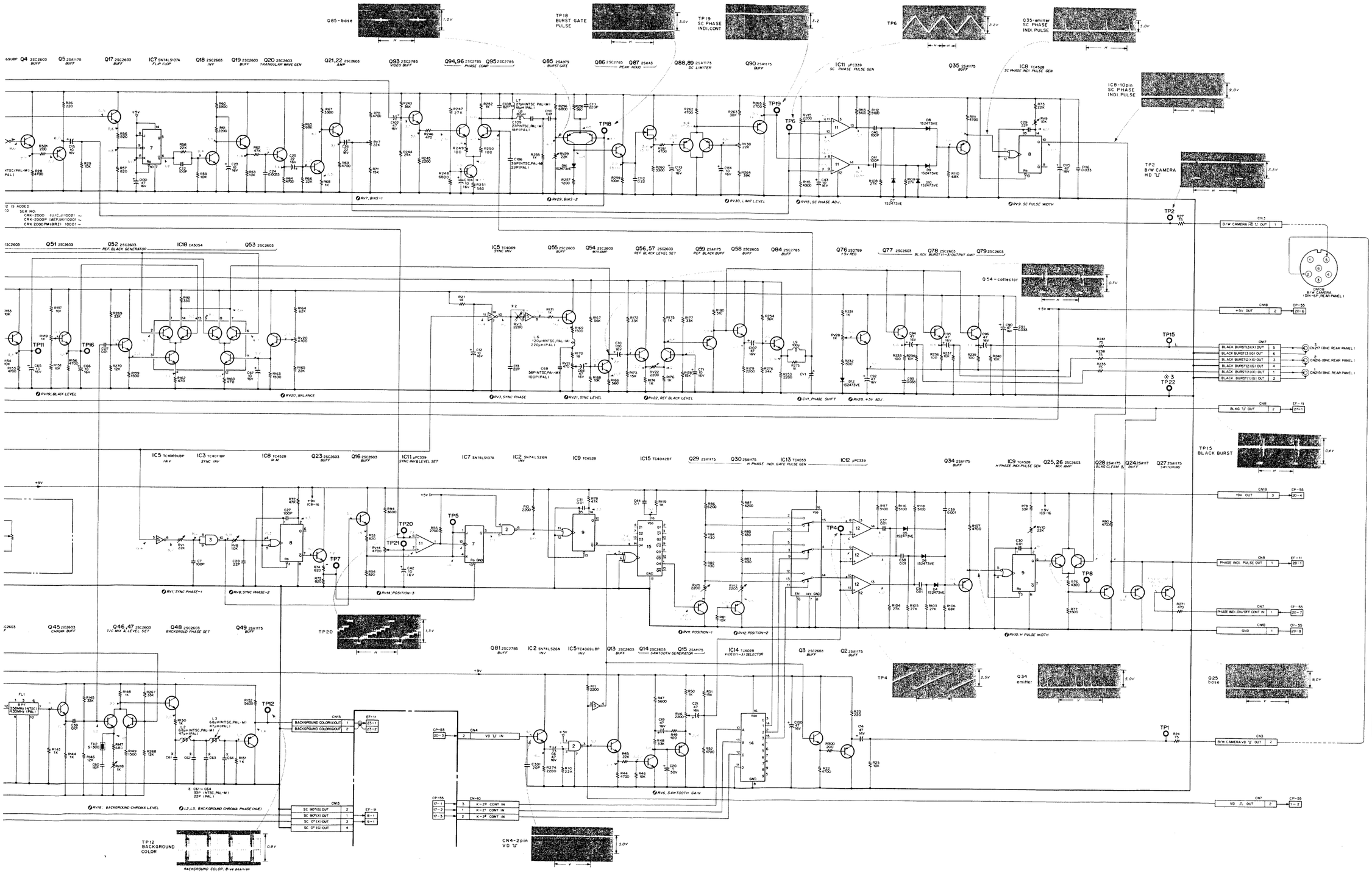


10-13(b)

10-14(b)

EF-12 BOARD (BACKGROUND COLOR VIDEO PROCESSOR, PHASE INDICATION PULSE GENERATOR)





※3 TP22 IS ADDED.
SER. NO.
CRK-2000 (J) 10111~
CRK-2000 (U/C) 10201~
CRK-2000P (AEP) 10191~
CRK-2000P (UK) 10011~
CRK-2000PM (BRZ) 10011~

NOTE

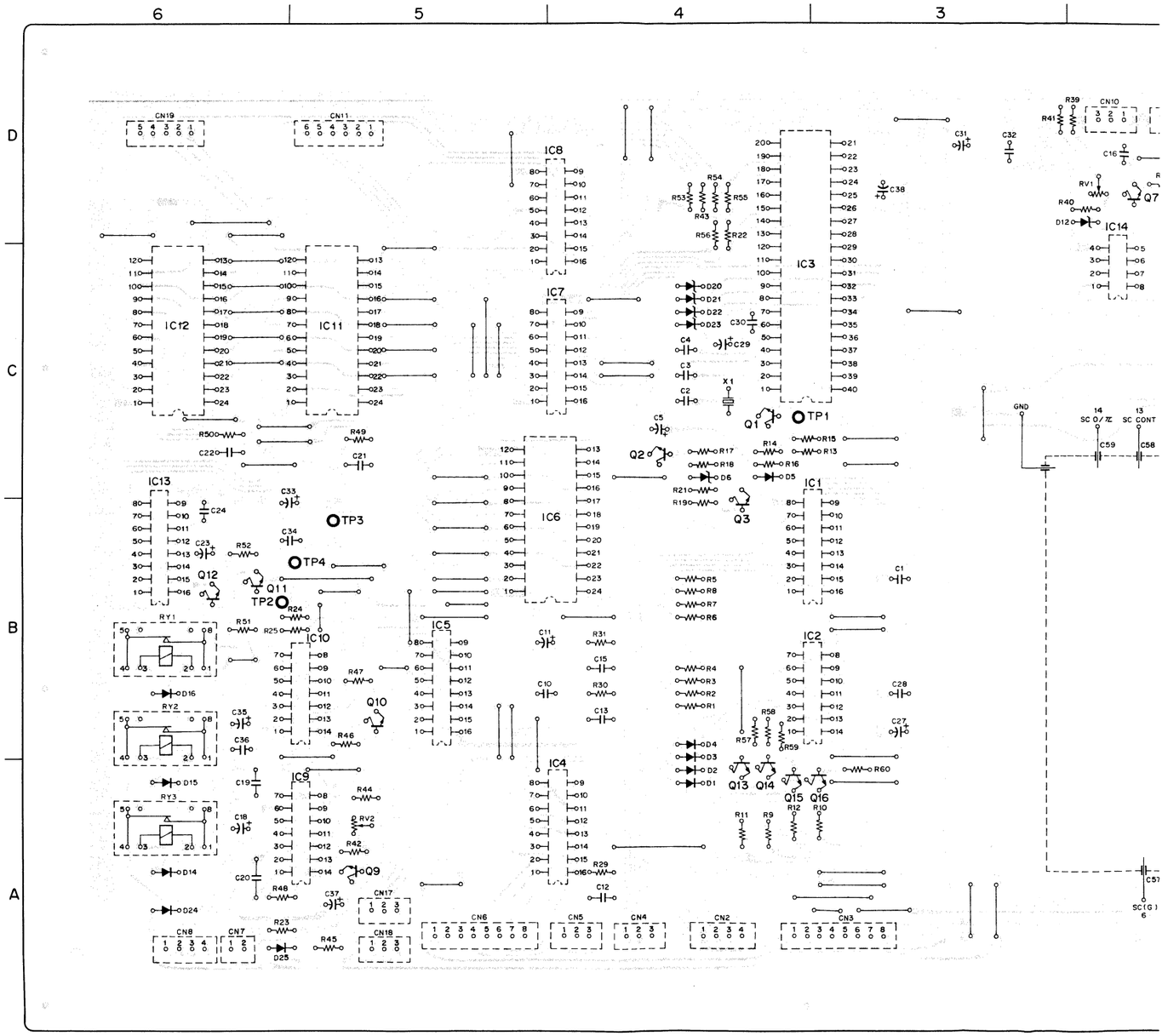
MARK	CHANGE INFORMATION	SERIAL NO.
※	C303 20PF ADD	(J) 10111~ (U/C) 10201~ (AEP) 10191~ (UK) 10011~ (BRZ) 10011~
※1	(NTSC ONLY) RV2 10K → R304 8200	(J) 10141~ (U/C) 10251~
※2	RV3 DELETE	(J) 10141~ (U/C) 10251~ (AEP) 10241~ (UK) 10011~ (BRZ) 10011~

CP-55

Serial No.		
J;	10111	to 10220
U/C;	10201	to 10340
AEP;	10191	to 10570
UK;	10011	to 10050

CP-55 BOARD (CHROMA KEYER CONTROL SYSTEM)

— SOLDERING SIDE —



CP-55 E

— SOLDERING

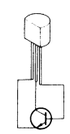
CRK-2000 (J

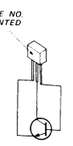
CRK-2000 (U/

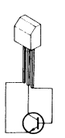
CRK-2000P (

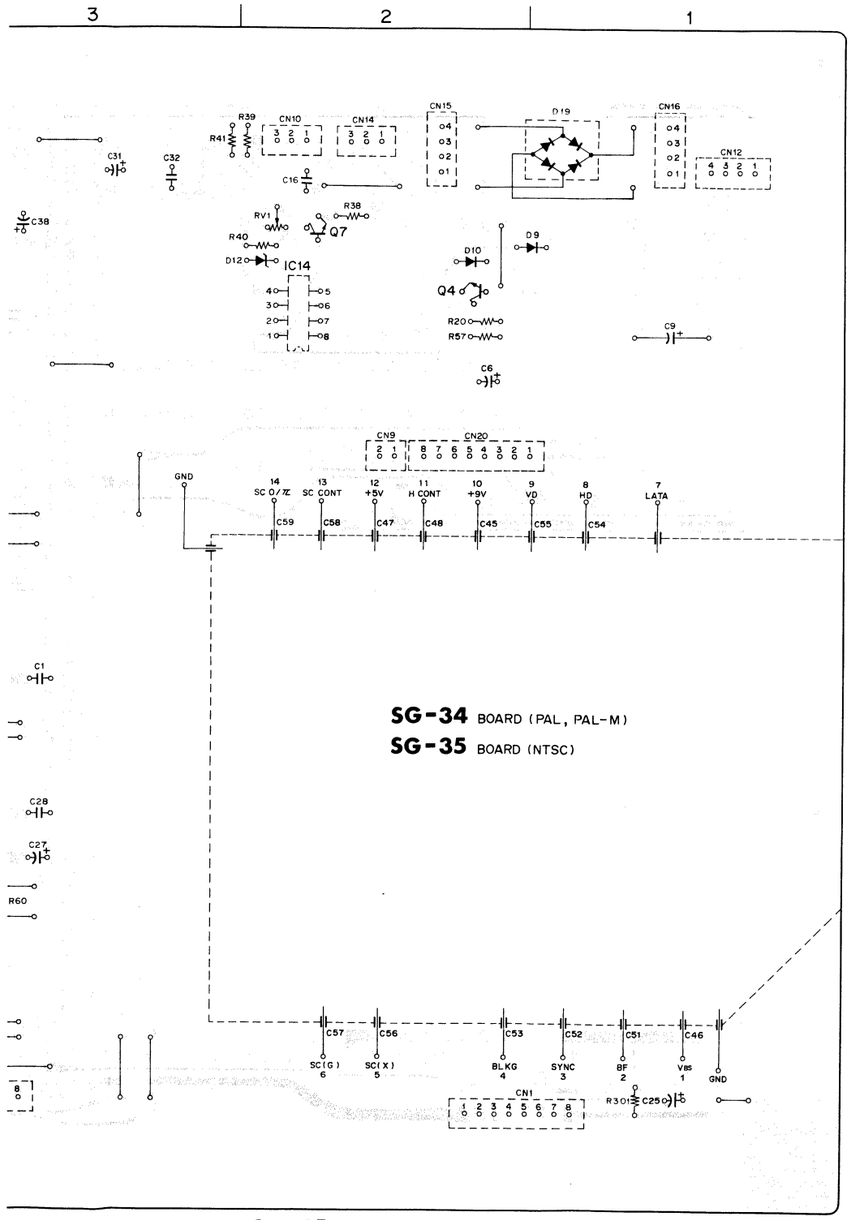
CRK-2000P (

CRK-2000PM







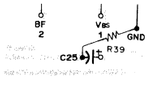


SG-34 BOARD (PAL, PAL-M)

SG-35 BOARD (NTSC)

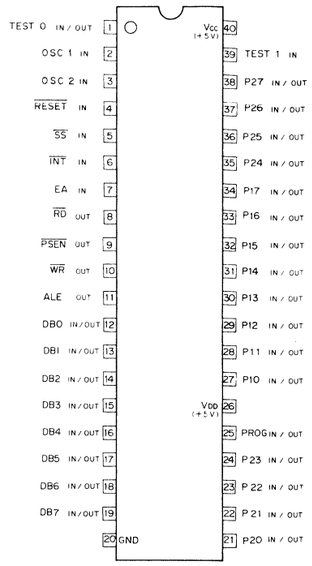
CN1	A - 2
CN2	A - 4
CN3	A - 3
CN4	A - 4
CN5	A - 4
CN6	A - 5
CN7	A - 6
CN8	A - 6
CN9	C - 2
CN10	D - 2
CN11	D - 5
CN12	D - 1
CN13	
CN14	D - 2
CN15	D - 2
CN16	D - 1
CN17	A - 5
CN18	A - 5
CN19	D - 6
CN20	C - 2
D1	A - 4
D2	A - 4
D3	A - 4
D4	B - 4
D5	C - 4
D6	C - 4
D9	D - 2
D10	D - 2
D12	D - 2
D14	A - 6
D15	A - 6
D16	B - 6
D19	D - 2
D20	C - 4
D21	C - 4
D22	C - 4
D24	A - 6
D25	A - 6
IC1	B - 4
IC2	B - 4
IC3	D - 4
IC4	A - 4
IC5	B - 5
IC6	B - 5
IC7	C - 4
IC8	D - 4
IC9	A - 5
IC10	B - 5
IC11	C - 5
IC12	C - 6
IC13	B - 6
IC14	C - 2
Q1	C - 4
Q2	C - 4
Q3	B - 4
Q4	C - 2
Q7	D - 2
Q8	
Q9	A - 5
Q10	B - 5
Q11	B - 6
Q12	B - 6
Q13	A - 4
Q14	A - 4
Q15	A - 4
Q16	A - 3
RV1	D - 2
RV2	A - 5
TP1	C - 4
TP2	
TP3	B - 5
TP4	B - 5
X1	C - 4

CP-55 BOARD-11
-SOLDERING SIDE-
CRK-2000(J) UP TO 10110
CRK-2000(U/C) UP TO 10200
CRK-2000P(AEP) UP TO 10190
CRK-2000P(UK) UP TO 10010
CRK-2000PM(BRZ) UP TO 10010

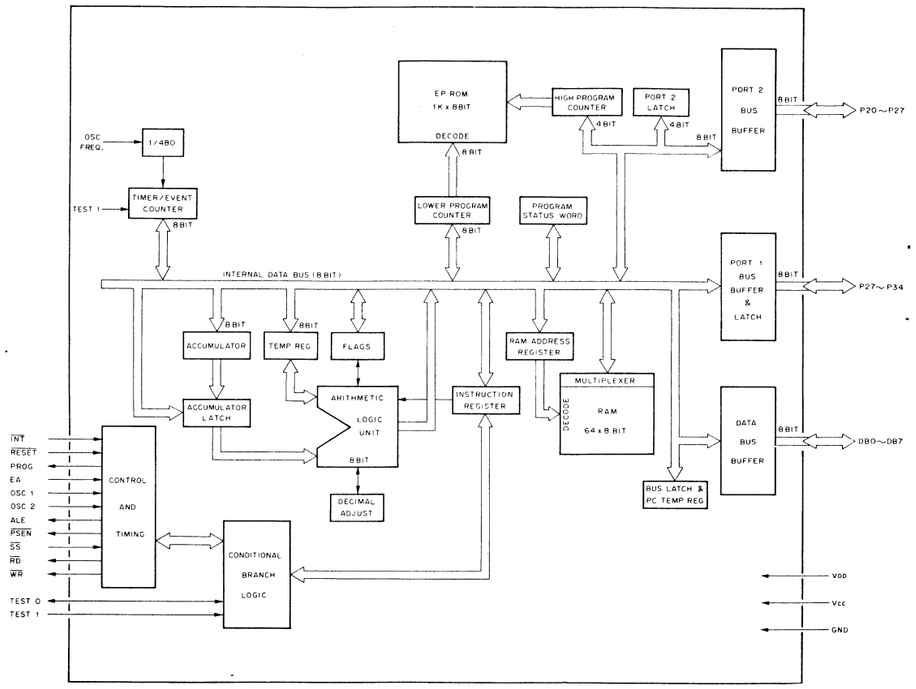


CP-55 BOARD-12
-SOLDERING SIDE-
CRK-2000(J) 10111 to 10220
CRK-2000(U/C) 10201 to 10340
CRK-2000(AEP) 10191 to 10570
CRK-2000(UK) 10011 to 10050

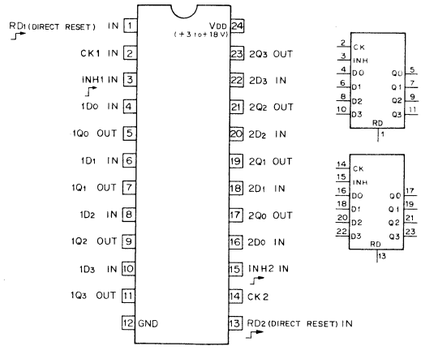
μPD8748D (NEC)
N-MOS 8-BIT MICROPROCESSOR
— TOP VIEW —


TEST 0 IN / OUT 1
OSC 1 IN 2
OSC 2 IN 3
RESET IN 4
SS IN 5
INT IN 6
EA IN 7
RD OUT 8
PSEN OUT 9
WR OUT 10
ALE OUT 11
DB0 IN/OUT 12
DB1 IN/OUT 13
DB2 IN/OUT 14
DB3 IN/OUT 15
DB4 IN/OUT 16
DB5 IN/OUT 17
DB6 IN/OUT 18
DB7 IN/OUT 19
20 GND
Vcc (+5V) 40
39 TEST 1 IN
38 P27 IN / OUT
37 P26 IN / OUT
36 P25 IN / OUT
35 P24 IN / OUT
34 P17 IN / OUT
33 P16 IN / OUT
32 P15 IN / OUT
31 P14 IN / OUT
30 P13 IN / OUT
29 P12 IN / OUT
28 P11 IN / OUT
27 P10 IN / OUT
VDD (+5V) 26
25 PROG IN / OUT
24 P23 IN / OUT
23 P22 IN / OUT
22 P21 IN / OUT
21 P20 IN / OUT

ALE; ADDRESS LATCH ENABLE
PSEN; PROGRAM STORE ENABLE
SS; SINGLE STEP
EA; EXTERNAL ACCESS
PROG; PROGRAM PULSE
RD; READ
WR; WRITE



MC14508BCP (MOTOROLA)
C-MOS 4-BIT LATCH
— TOP VIEW —

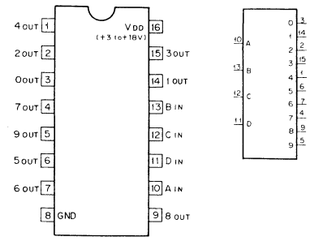


1 STAGE

INPUTS								OUTPUTS				
RD	CK	INH	D3	D2	D1	D0	Q0	Q3	Q2	Q1	Q0	
0	↑	0	0	0	0	0	0	0	0	0	0	
0	↑	0	0	0	0	1	0	0	0	0	1	
0	↑	0	0	0	1	0	0	0	0	1	0	
0	↑	0	0	1	0	0	0	0	1	0	0	
0	↑	0	1	0	0	0	1	0	0	0	0	
0	0	0	X	X	X	X	X	LATCHED				
1	X	0	X	X	X	X	X	0	0	0	0	
X	X	1	X	X	X	X	X	OPEN				

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

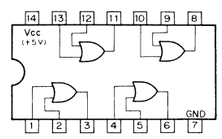
TC4028BP (TOSHIBA)
C-MOS BCD TO DECIMAL DECODER
— TOP VIEW —

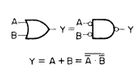


STATE	INPUTS				OUTPUTS									
	D	C	B	A	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
1	0	0	0	1	0	1	0	0	0	0	0	0	0	0
2	0	0	1	0	0	0	1	0	0	0	0	0	0	0
3	0	0	1	1	0	0	0	1	0	0	0	0	0	0
4	0	1	0	0	0	0	0	0	1	0	0	0	0	0
5	0	1	0	1	0	0	0	0	0	1	0	0	0	0
6	0	1	1	0	0	0	0	0	0	0	1	0	0	0
7	0	1	1	1	0	0	0	0	0	0	0	1	0	0
8	1	X	X	0	0	0	0	0	0	0	0	0	1	0
9	1	X	X	1	0	0	0	0	0	0	0	0	0	1

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

SN74LS32N (TI)
TTL 2-INPUT POSITIVE-OR GATE
— TOP VIEW —

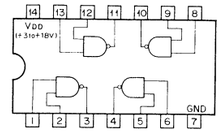


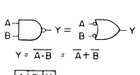


A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

0:LOW LEVEL
1:HIGH LEVEL

TC4011BP (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —





A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

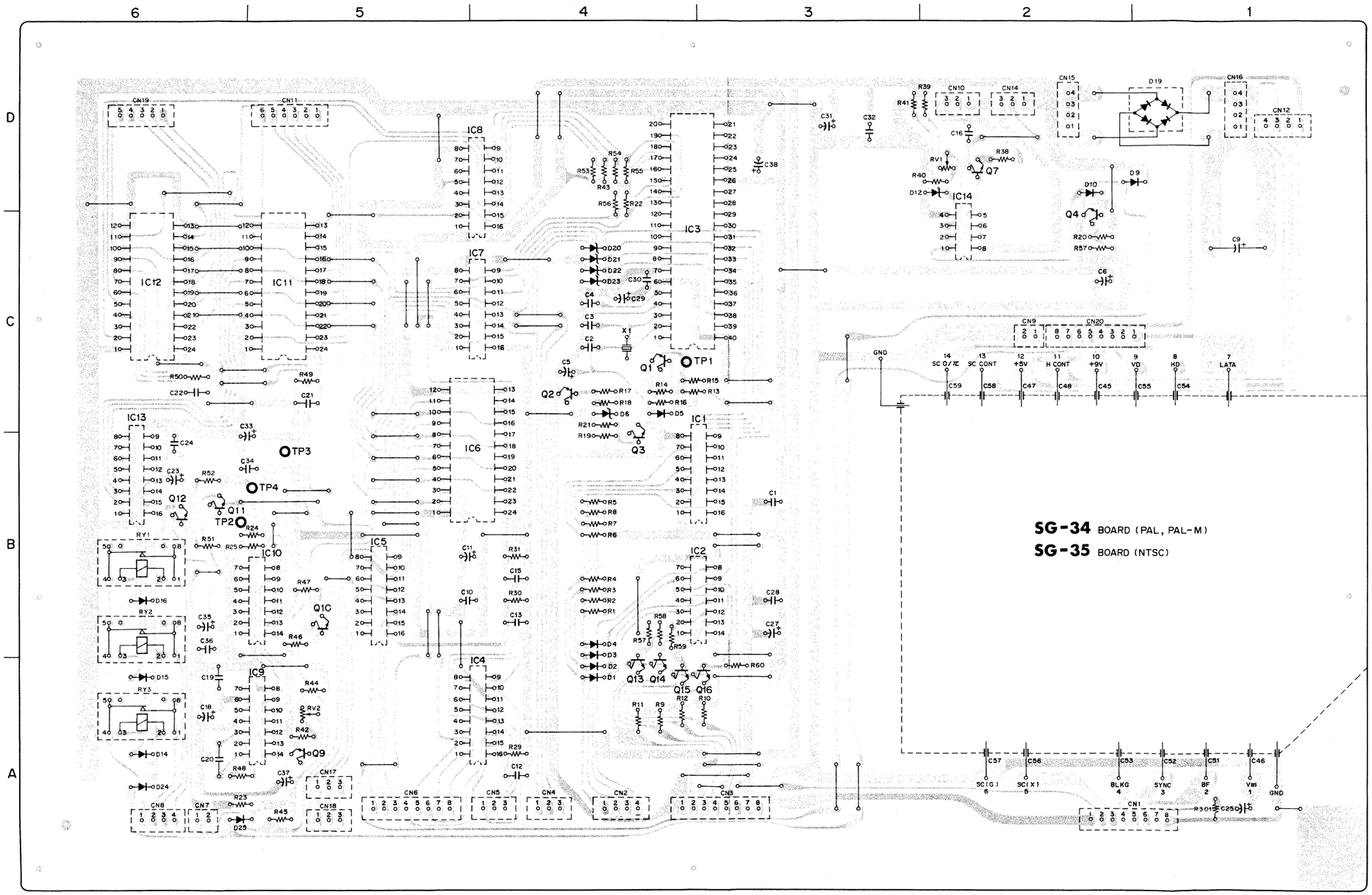
0:LOW LEVEL
1:HIGH LEVEL

Serial No.		
	J	: 10221 and higher
	U/C	: 10341 and higher
	AEP	: 10571 and higher
	UK	: 10051 and higher
	BRZ	: 10011 and higher

CP-55 BOARD (CHROMA KEYER CONTROL SYSTEM)

– SOLDERING SIDE –

NEW



CN1 A-2
CN2 A-4
CN3 A-3
CN4 A-4
CN5 A-4
CN6 A-5
CN7 A-6
CN8 A-6
CN9 C-2
CN10 D-2
CN11 D-5
CN12 D-1
CN13
CN14 D-2
CN15 D-2
CN16 D-1
CN17 A-5
CN18 A-5
CN19 D-6
CN20 C-2

D1 A-4
D2 A-4
D3 A-4
D4 B-4
D5 C-4
D6 C-4
D9 D-2
D10 D-2
D12 D-2
D14 A-6
D15 A-6
D16 B-6
D19 D-2
D20 C-4
D21 C-4
D22 C-4
D24 A-6
D25 A-6

IC1 B-4
IC2 B-4
IC3 D-4
IC4 A-4
IC5 B-5
IC6 B-5
IC7 C-4
IC8 D-4
IC9 A-5
IC10 B-5
IC11 C-5
IC12 C-6
IC13 B-6
IC14 C-2

Q1 C-4
Q2 C-4
Q3 B-4
Q4 C-2
Q7 D-2
Q8
Q9 A-5
Q10 B-5
Q11 B-6
Q12 B-6
Q13 A-4
Q14 A-4
Q15 A-4
Q16 A-3

RV1 D-2
RV2 A-5

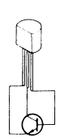
TP1 C-4
TP2
TP3 B-5
TP4 B-5

X1 C-4

CP-55 BOARD – 13

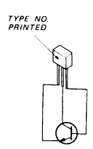
–SOLDERING SIDE–

CRK-2000(J)	10221 ~
CRK-2000(U/C)	10341 ~
CRK-2000P(AEP)	10571 ~
CRK-2000P(UK)	10051 ~
CRK-2000PM(BRZ)	10011 ~

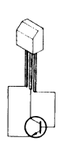


2SC1364

10-22(b)



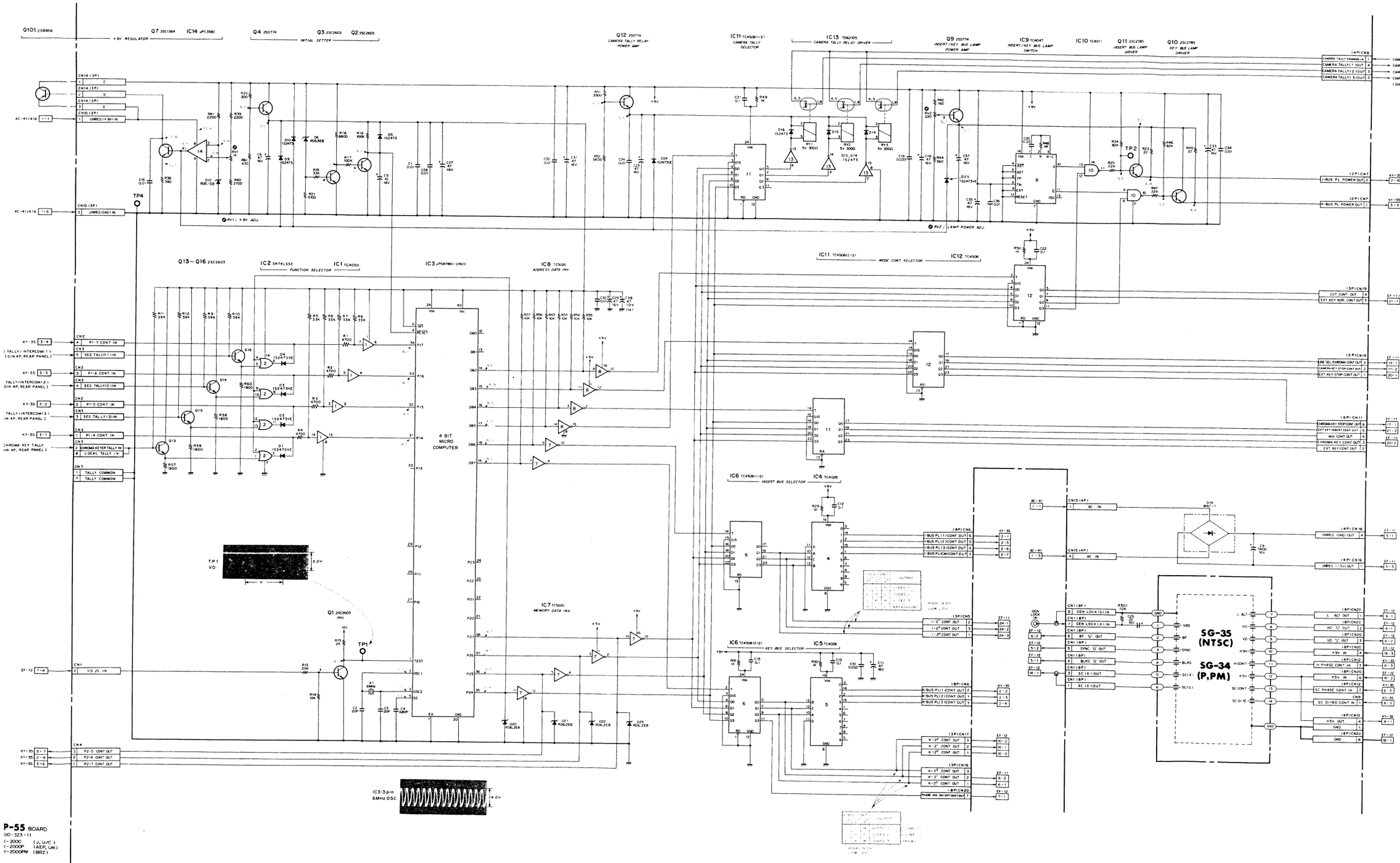
2SC2785

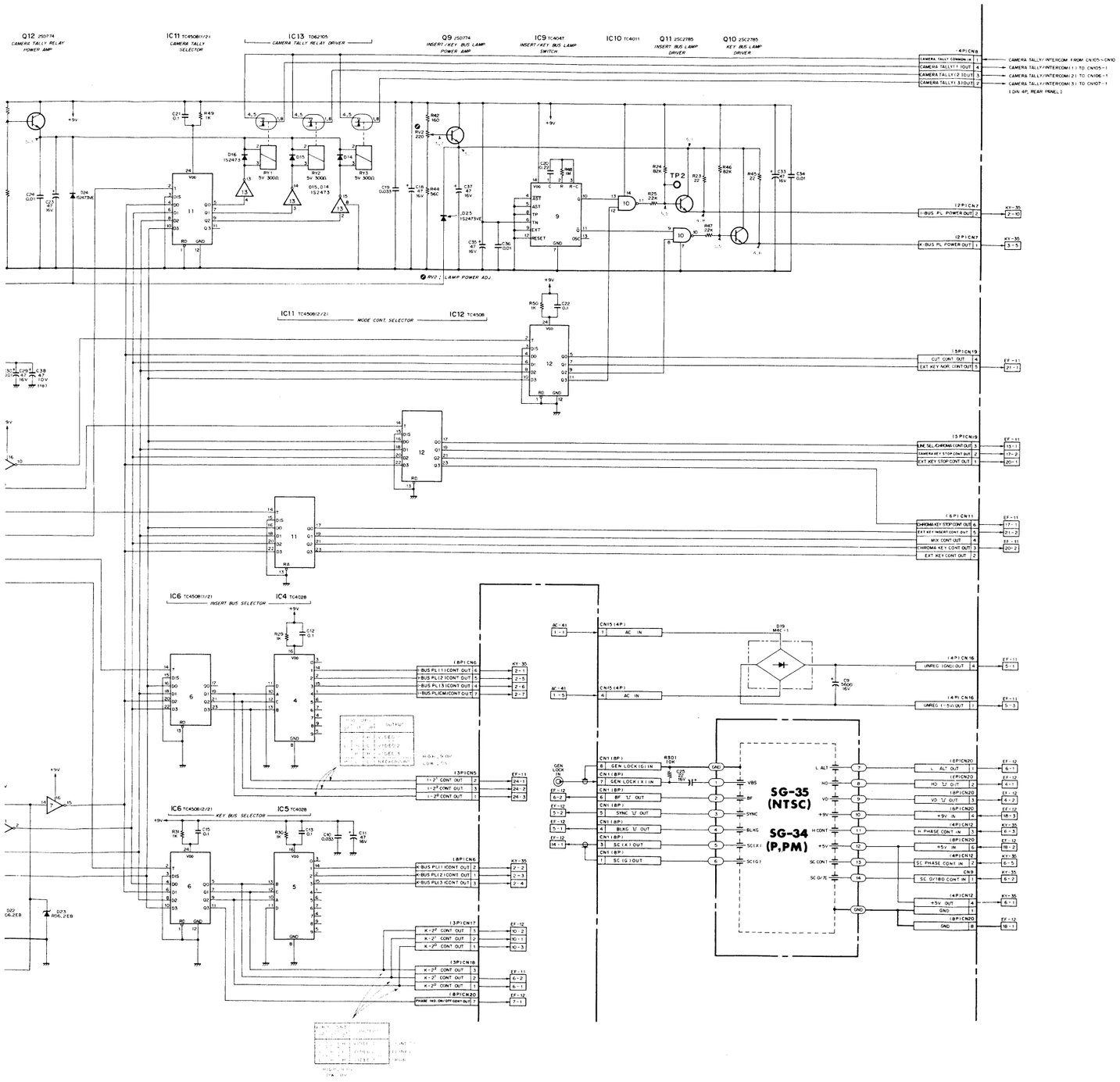


2SD774

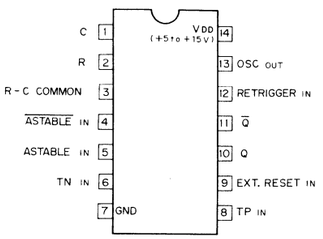
10-23(b)

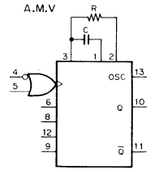
CP-55 BOARD (CHROMA KEYER CONTROL SYSTEM)



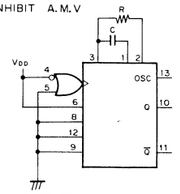


TC4047BP (TOSHIBA)
C-MOS MONOSTABLE/ASTABLE MULTIVIBRATOR
— TOP VIEW —



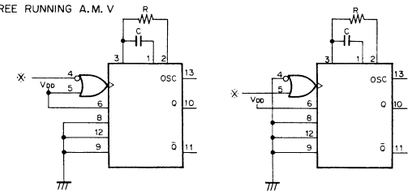


INHIBIT A.M.V



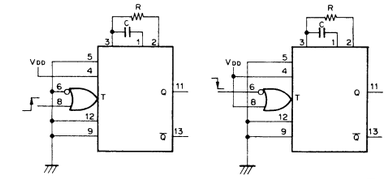
OUTPUTS PULSE WIDTH
Q, $\bar{Q}$; CK = 4.40RC
OSC ; CK = 2.20RC

FREE RUNNING A.M.V

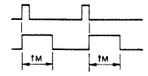


※ THE INPUT PULSE IS NOT CONCERNED WITH "H" AND "L"

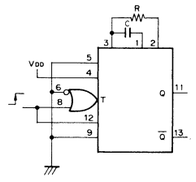
NON-RETRIGGERABLE M.M.V



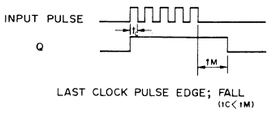
INPUT PULSE



RETRIGGERABLE M.M.V



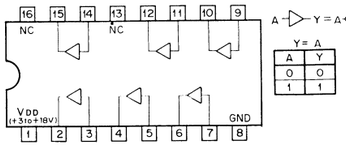
INPUT PULSE



LAST CLOCK PULSE EDGE; FALL (tC < tM)

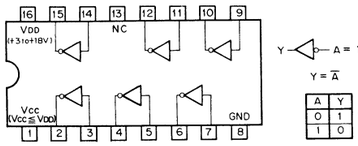
OUTPUT PULSE WIDTH tM = 2.48RC

TC4050BP (TOSHIBA)
C-MOS NON-INVERTING TYPE BUFFER/CONVERTER
— TOP VIEW —



A	Y
0	0
1	1

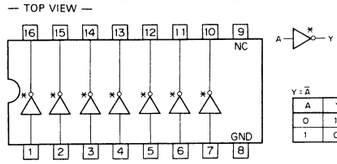
TC5020BP (TOSHIBA)
C-MOS LOW-TO-HIGH VOLTAGE TRANSLATION INVERTER
— TOP VIEW —



A	Y
0	1
1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

TD62105P (TOSHIBA)
TTL INVERTING DRIVER WITH OPEN COLLECTOR
— TOP VIEW —

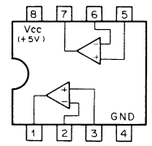


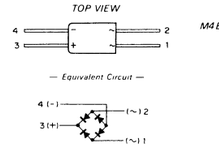
A	Y
0	1
1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

※ OPEN COLLECTOR

uPC358C (NEC)
DUAL OPERATIONAL AMPLIFIERS
— TOP VIEW —

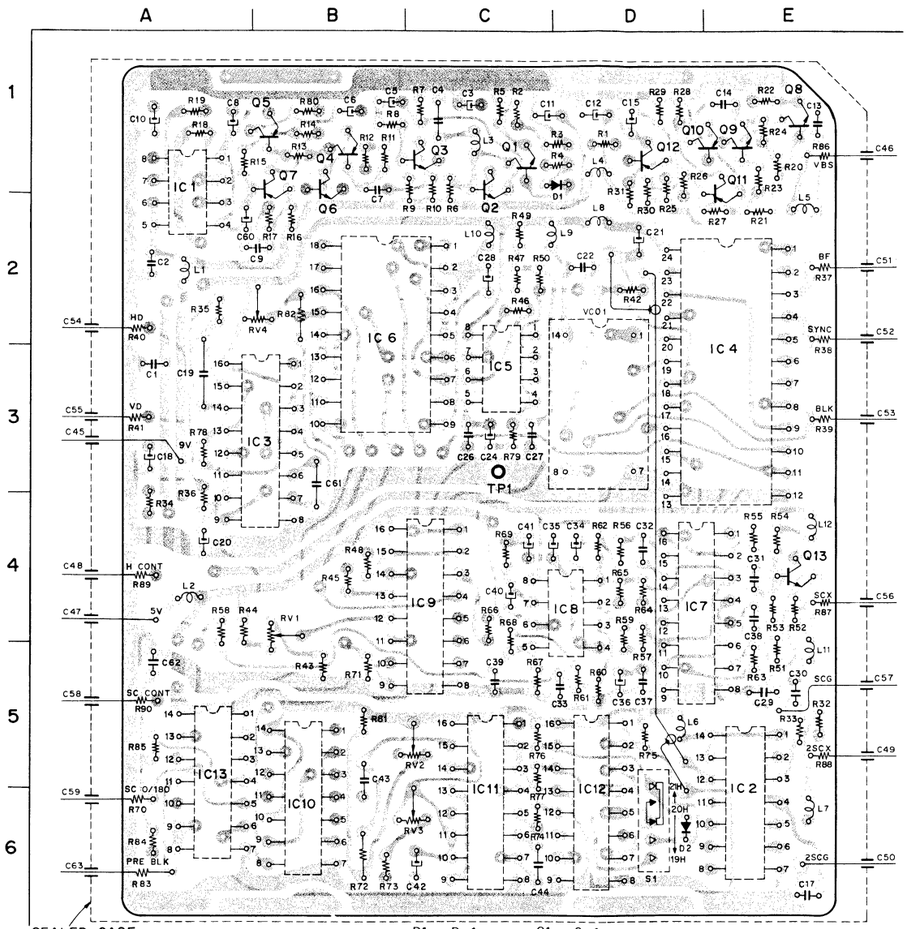




SG-35 BOARD (SYNC GENERATOR SYSTEM)

— SOLDERING SIDE —

[For CRK-2000 use]



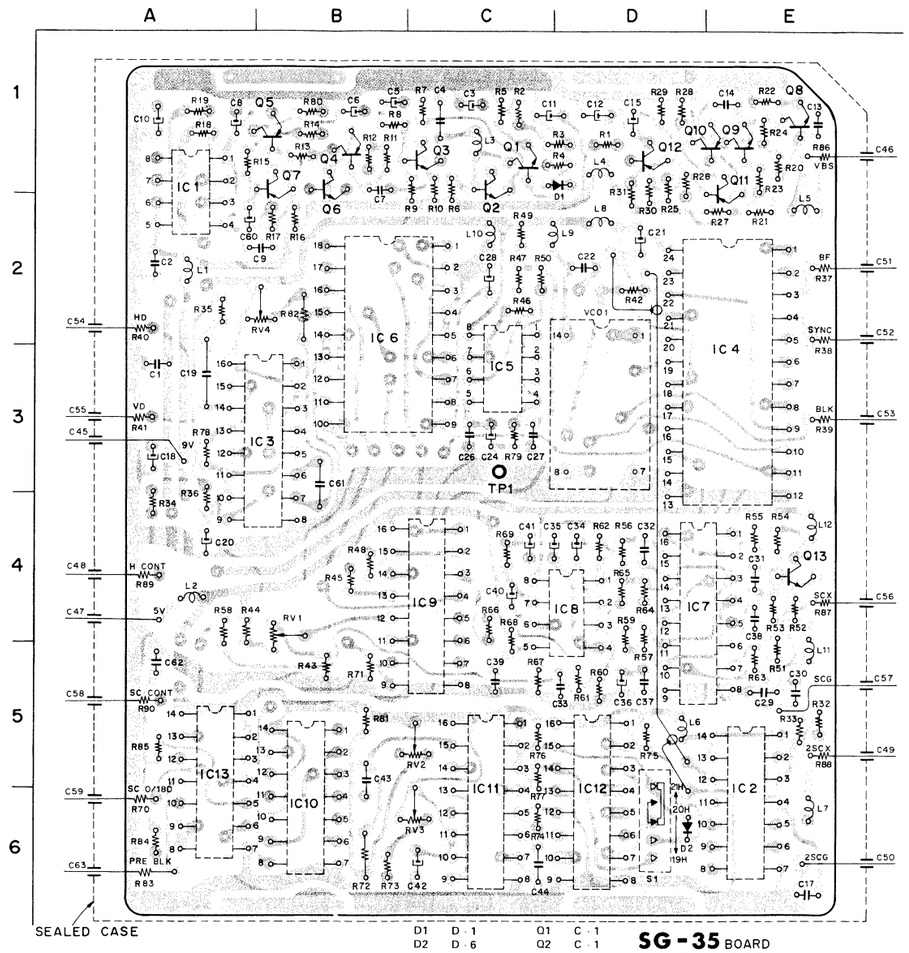
D1	D - 1	Q1	C - 1
D2	D - 6	Q2	C - 1
		Q3	C - 1
IC1	A - 1	Q4	B - 1
IC2	E - 6	Q5	B - 1
IC3	B - 3	Q6	B - 1
IC4	E - 3	Q7	B - 1
IC5	C - 3	Q8	E - 1
IC6	B - 2	Q9	E - 1
IC7	E - 4	Q10	D - 1
IC8	D - 4	Q11	E - 1
IC9	C - 4	Q12	D - 1
IC10	B - 6	Q13	E - 4
IC11	C - 6		
IC12	D - 6	RV1	B - 4
IC13	A - 6	RV2	C - 5
		RV3	C - 6
		RV4	B - 2
		TP1	C - 3

SG-35 BOARD
– SOLDERING SIDE –
1-603-028-14
SEG-2000
DXC-1800
SEG-2000A
CRK-2000

SG-35 BOARD (SYNC GENERATOR SYSTEM)

— SOLDERING SIDE —

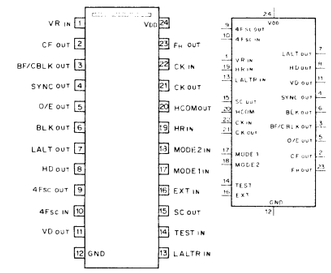
[For CRK-2000 use]



D1	D · 1		Q1	C · 1	
D2	D · 6		Q2	C · 1	
			Q3	C · 1	
IC1	A · 1		Q4	B · 1	
IC2	E · 6		Q5	B · 1	
IC3	B · 3		Q6	B · 1	
IC4	E · 3		Q7	B · 1	
IC5	C · 3		Q8	E · 1	
IC6	B · 2		Q9	E · 1	
IC7	E · 4		Q10	D · 1	
IC8	D · 4		Q11	E · 1	
IC9	C · 4		Q12	D · 1	
IC10	B · 6		Q13	E · 4	
IC11	C · 6				
IC12	D · 6		RV1	B · 4	
IC13	A · 6		RV2	C · 5	
			RV3	C · 6	
			RV4	B · 2	
			TP1	C · 3	

SG-35 BOARD
–SOLDERING SIDE–
1-603-028-14
SEG-2000
DXC-1800
SEG-2000A
CRK-2000

CX773A (SONY)
C-MOS SYNC GENERATOR (NTSC, PAL-M, PAL, SECAM)
—TOP VIEW—



O/E : ODD/EVEN FIELD
CF : COLOUR FRAME PULSE
HCOM : H COMPARATOR

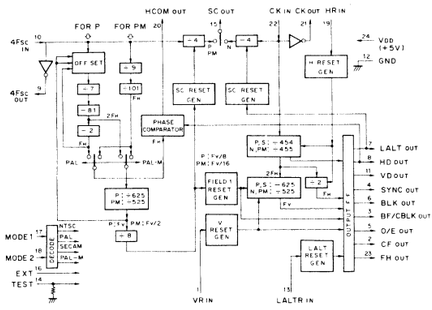
SYSTEM	4Fsc	CLOCK
NTSC	910 FH	910FH
PAL	1135FH+2FV	908FH
PALM	909FH	910FH
SECAM	—	908FH

INTUPS MODE 1	INTUPS MODE 2	SYSTEM
0	0	NTSC
0	1	SECAM
1	0	PALM
1	1	PAL

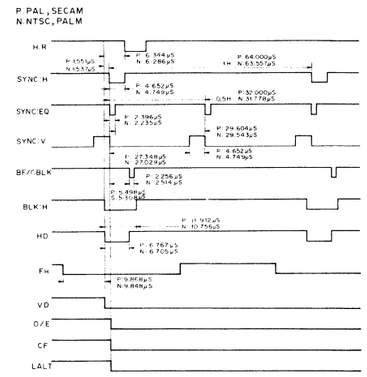
"1" VDD
"0" GND

INTUPS EXT	INTUPS TEST	FUNCTION
0	0	INTERNAL
0	1	INVALID
1	0	EXT
1	1	TEST

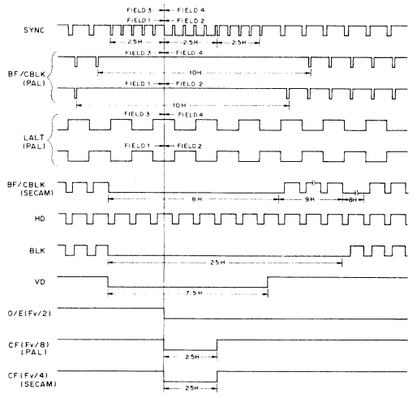
TEST "0" OPEN
(INTERNALLY PULLED DOWN)



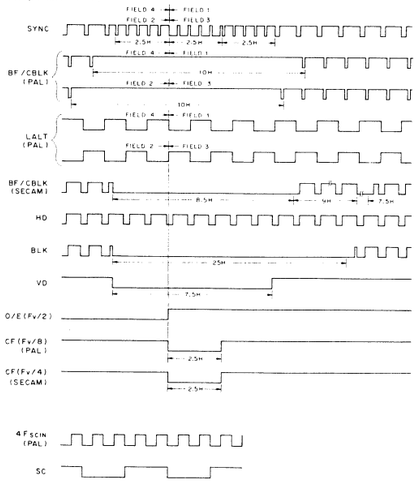
P: PAL, SECAM
N: NTSC, PALM



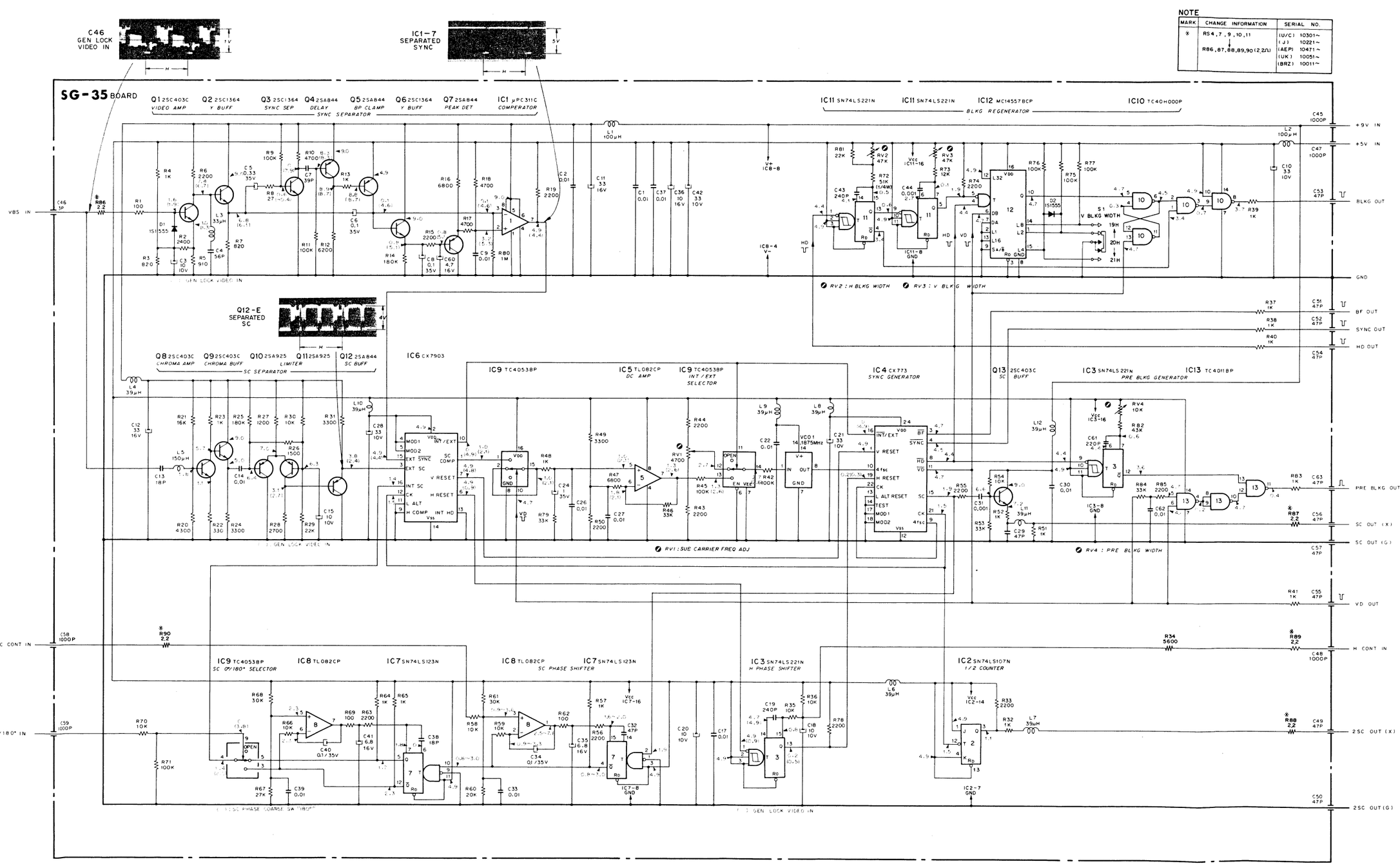
PAL, SECAM (FIELD 4,2)



PAL, SECAM (FIELD 1, 3)



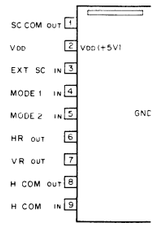
SG-35 BOARD (SYNC GENERATOR SYSTEM)
[For CRK-2000 use]



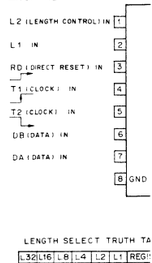
NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
*	RS4,7,9,10,11	(U/C) 10301~
		(J) 10221~
	R86,87,88,89,90(2.2Ω)	(AEP) 10471~
		(UK) 10051~
		(BRZ) 10011~

CX7903 (SONY)
CMOS GENLOCK DRIVER FOR C
— TOP VIEW —



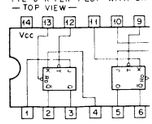
MC14557BCP (MOTOROLA
C-MOS 1-TO-64-BIT VARIA
—TOP VIEW—



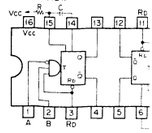
LENGTH SELECT TRUTH TA

L32	L16	L8	L4	L2	L1	REG
0	0	0	0	0	0	
0	0	0	0	0	1	
0	0	0	0	1	0	
0	0	0	0	1	1	
0	0	0	1	0	0	
:	:	:	:	:	:	:
1	1	1	1	0	0	
1	1	1	1	0	1	
1	1	1	1	1	0	
1	1	1	1	1	1	

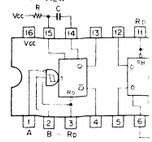
SN74LS107N (TI)
TTL J-K FLIP FLOP WITH DIR
— TOP VIEW —



SN74LS123N (TI)
TTL RETRIGGERABLE MONOST
— TOP VIEW —

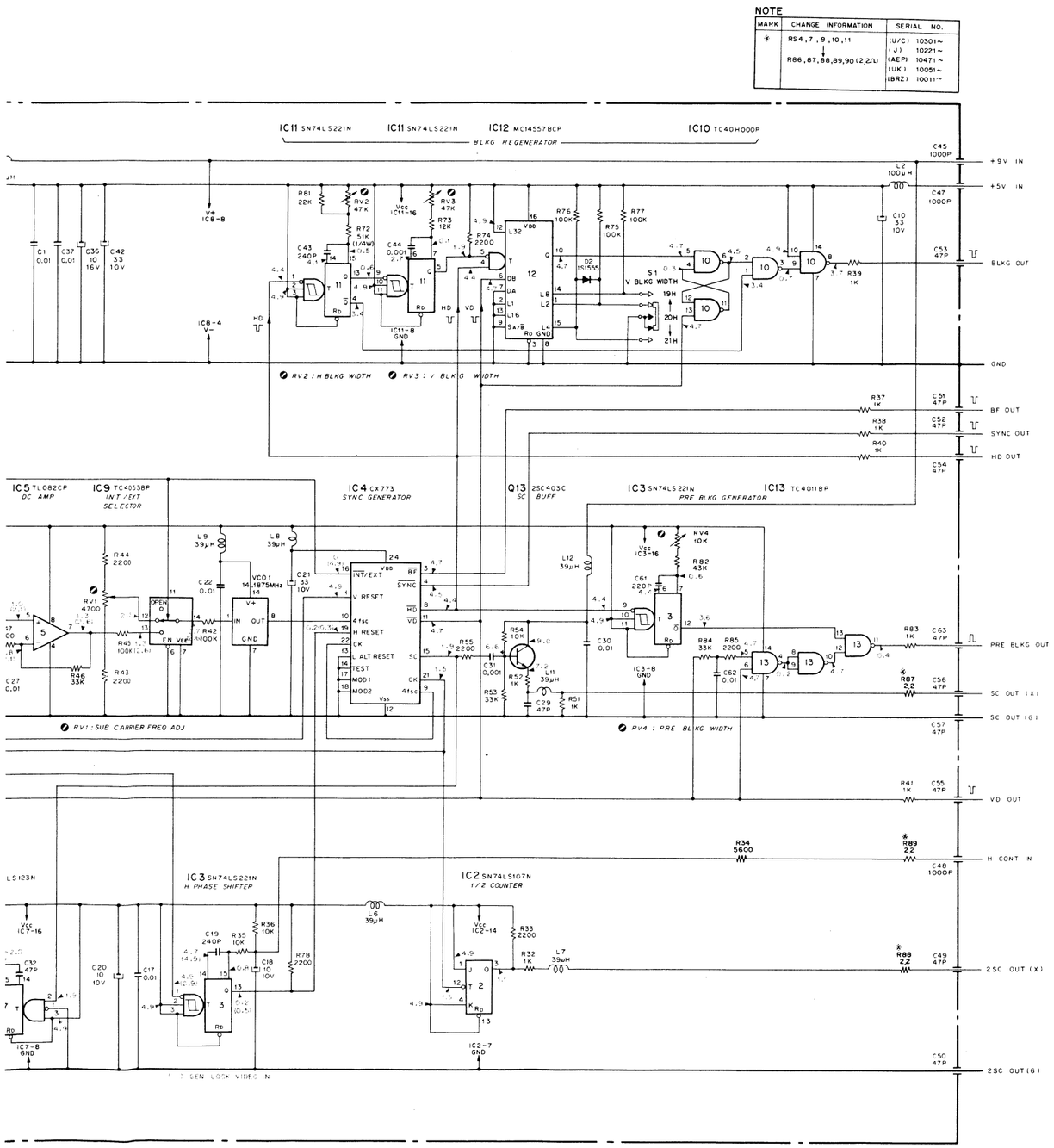


SN74LS221N (TI)
TTL MONOSTABLE MULTIVIBR
— TOP VIEW —

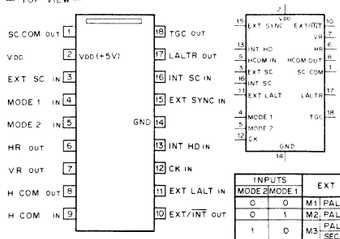


NOTE

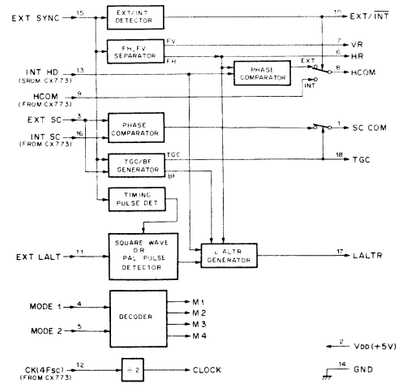
MARK	CHANGE INFORMATION	SERIAL NO.
*	RS4,7,9,10,11 ↓ R86,87,88,89,90(2.2Ω)	(U/C) 10301~ (J) 10221~ (AEP) 10471~ (UK) 10051~ (BRZ) 10011~



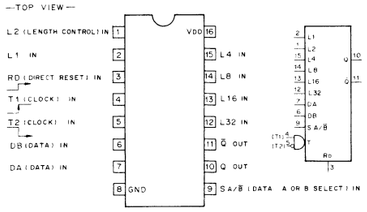
CX7903 (SONY)
CMOS GENLOCK DRIVER FOR CX773
— TOP VIEW —



INPUTS MODE 2	INPUTS MODE 1	EXT LOCK MODE	
0	0	M1	PAL. VBS
0	1	M2	PALM. VBS
1	0	M3	PAL. VS/SC/LALT SECAM. VS/SC/LALT
1	1	M4	NTSC. VBS NTSC. VS/SC PALM. VS/SC/LALT



MC14557BCP (MOTOROLA)
C-MOS 1-TO-64-BIT VARIABLE LENGTH SHIFT REGISTER
— TOP VIEW —



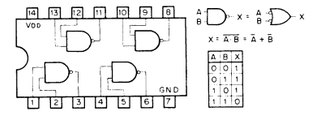
LENGTH SELECT TRUTH TABLE

L32	L16	L8	L4	L2	L1	REGISTER LENGTH
0	0	0	0	0	0	1 - BIT
0	0	0	0	0	1	2 - BIT
0	0	0	0	1	0	3 - BIT
0	0	0	0	1	1	4 - BIT
0	0	0	1	0	0	5 - BIT
:	:	:	:	:	:	:
1	1	1	1	0	0	61 - BIT
1	1	1	1	0	1	62 - BIT
1	1	1	1	1	0	63 - BIT
1	1	1	1	1	1	64 - BIT

INPUTS RD	INPUTS SA/B	INPUTS T1	INPUTS T2	OUTPUT
0	0	↑	0	DB
0	1	↑	0	DA
0	0	1	↓	DB
0	1	1	↓	DA
1	X	X	X	0

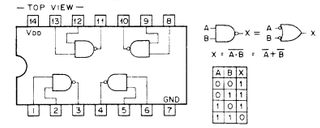
0 ; LOW
1 ; HIGH
X ; DON'T CARE

TC40H000P (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —



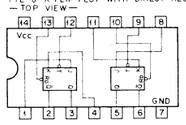
A	B	X
0	0	1
0	1	1
1	0	1
1	1	0

TC4011BP (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —



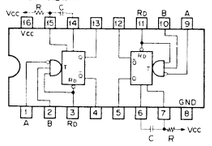
A	B	X
0	0	1
0	1	1
1	0	1
1	1	0

SN74LS107N (TI)
TTL J-K FLIP FLOP WITH DIRECT RESET
— TOP VIEW —



INPUTS RD	INPUTS T	INPUTS J	INPUTS K	OUT Qn+1
L	X	X	X	L
H	↓	L	L	Qn
H	↑	L	H	L
H	↓	H	L	H
H	↑	H	H	Q̄n
H	H	X	X	Qn

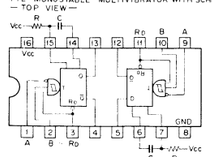
SN74LS123N (TI)
TTL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR WITH DIRECT RESET
— TOP VIEW —



INPUTS Rd	INPUTS A	INPUTS B	OUTPUTS Q	OUTPUTS Q̄
L	X	X	L	H
X	H	X	L	H
X	X	L	L	H
H	↓	↑	⊓	⊔
H	↓	H	⊓	⊔
↑	L	↑	⊓	⊔

OUTPUT PULSE WIDTH

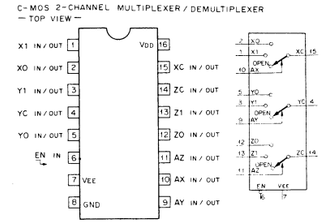
SN74LS221N (TI)
TTL MONOSTABLE MULTIVIBRATOR WITH SCHMITT TRIGGER INPUT
— TOP VIEW —



INPUTS Rd	INPUTS A	INPUTS B	OUTPUTS Q	OUTPUTS Q̄
L	X	X	L	H
X	H	X	L	H
X	X	L	L	H
H	↓	↑	⊓	⊔
H	↓	H	⊓	⊔
↑	L	H	⊓	⊔

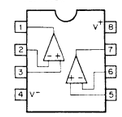
OUTPUT PULSE WIDTH = 0.7CR

TC4053BP (TOSHIBA)
C-MOS 2-CHANNEL MULTIPLEXER / DEMULTIPLEXER
— TOP VIEW —

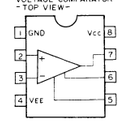


CONT. INPUTS EN	CONT. INPUTS A (XC,YC,ZC)	ON CHANNEL
0	0	0
0	1	1
1	X	OPEN

TL082CP (TI)
OPERATIONAL AMPLIFIER
(JFET-INPUT)
— TOP VIEW —



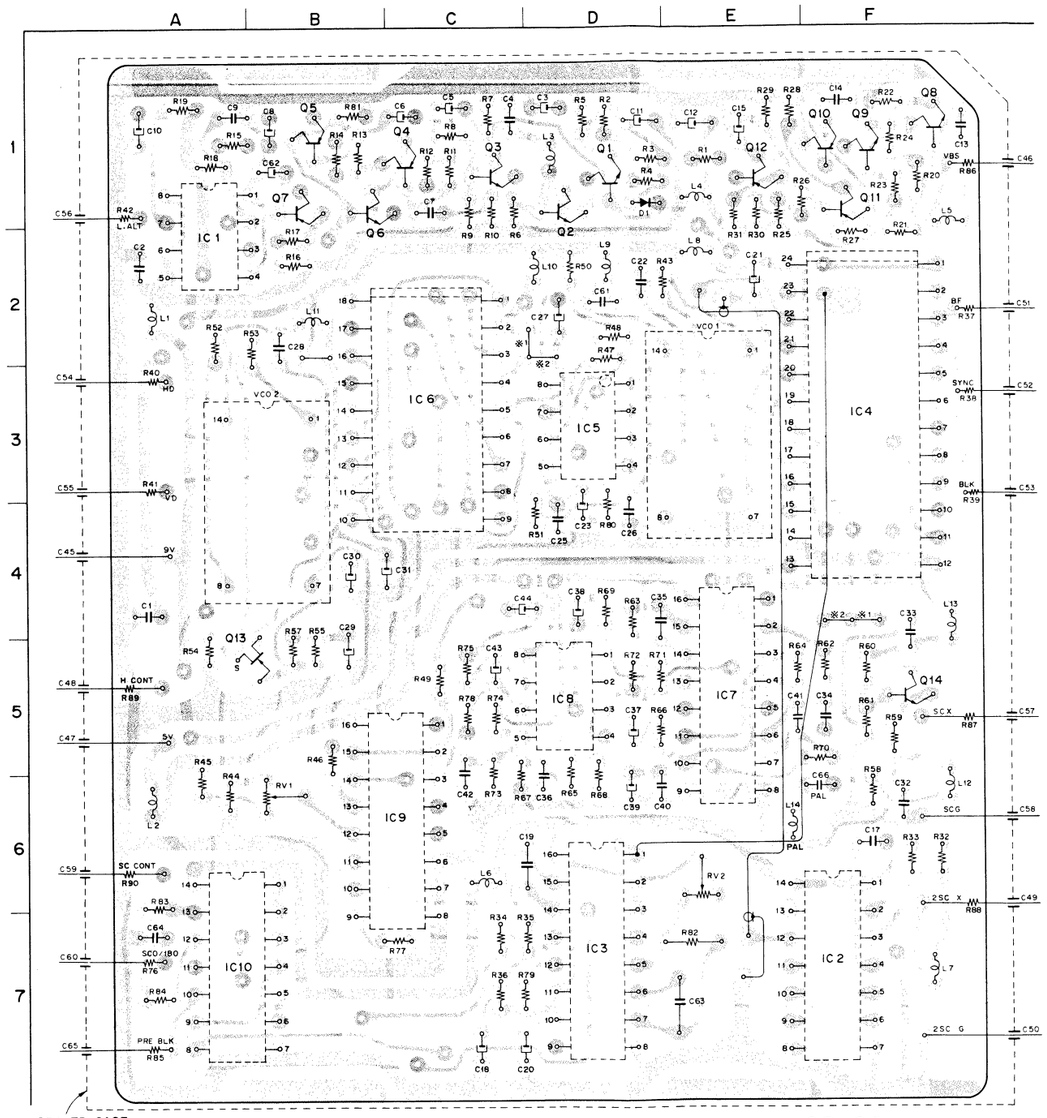
μPC311C (NEC)
VOLTAGE COMPARATOR
— TOP VIEW —



SG-34 BOARD (SYNC GENERATOR SYSTEM)

— SOLDERING SIDE —

[For CRK-2000P/PM]

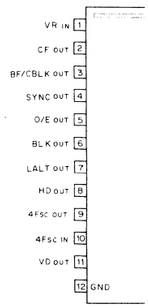


D1	D · 1
IC1	A · 2
IC2	F · 7
IC3	D · 7
IC4	F · 3
IC5	D · 3
IC6	C · 3
IC7	E · 5
IC8	D · 5
IC9	C · 6
IC10	A · 7
Q1	D · 1
Q2	D · 1
Q3	C · 1
Q4	C · 1
Q5	B · 1
Q6	B · 1
Q7	B · 1
Q8	F · 1
Q9	F · 1
Q10	F · 1
Q11	F · 1
Q12	E · 1
Q13	B · 5
Q14	F · 5
RV1	B · 6
RV2	E · 6

SG-34 BOARD
– SOLDERING SIDE –
1-603-029-14
SEG-2000P/PM
DXC-1800P/PM
SEG-2000AP/APM
CRK-2000P/PM

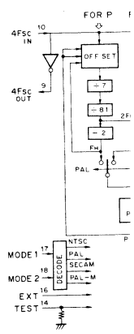
	※1	※2
PAL	OPEN	SHORT
PAL-M	SHORT	OPEN

CX773A (SONY)
C-MOS SYNC GENERATOR (
— TOP VIEW —



O/E : ODD/EVEN FIELD
CF : COLOUR FRAME PU
HCOM : H COMPARATOR

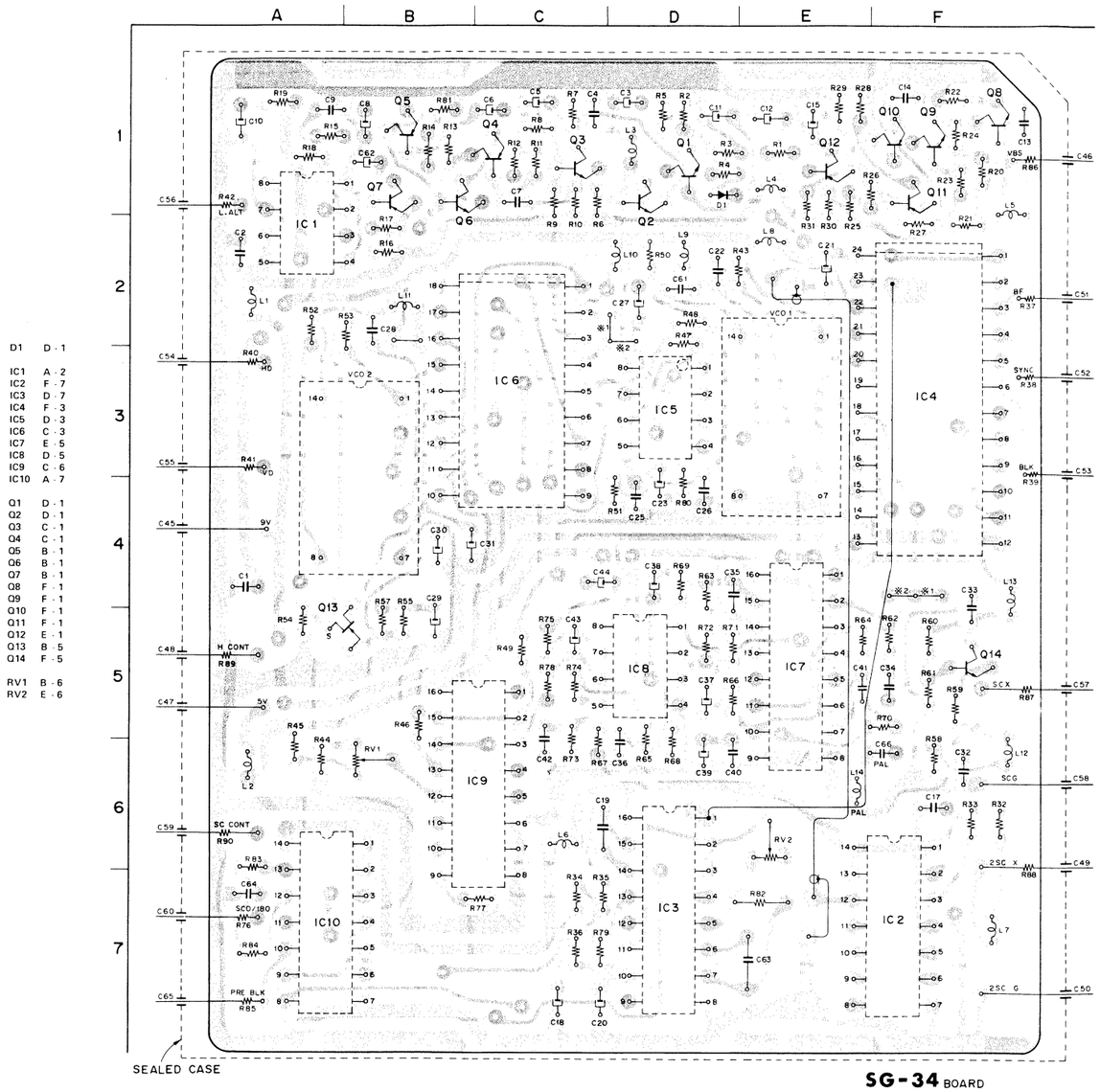
SYSTEM	4Fsc	CLO
NTSC	910 FH	910
PAL	1135 FH+2FV	908
PALM	909 FH	910
SECAM	——	908



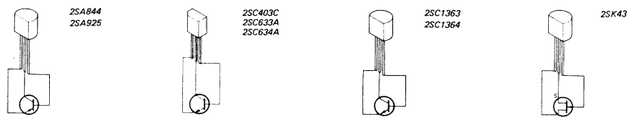
SG-34 BOARD (SYNC GENERATOR SYSTEM)

— SOLDERING SIDE —

[For CRK-2000P/PM]



D1	D-1
IC1	A-2
IC2	F-7
IC3	D-7
IC4	F-3
IC5	D-3
IC6	C-3
IC7	E-5
IC8	D-5
IC9	C-6
IC10	A-7
Q1	D-1
Q2	D-1
Q3	C-1
Q4	C-1
Q5	B-1
Q6	B-1
Q7	B-1
Q8	F-1
Q9	F-1
Q10	F-1
Q11	F-1
Q12	E-1
Q13	B-5
Q14	F-5
RV1	B-6
RV2	E-6



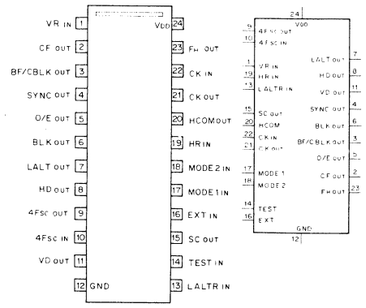
SG-34 BOARD
— SOLDERING SIDE —
1-603-029-14
SEG-2000P/PM
DXC-1800P/PM
SEG-2000AP/APM
CRK-2000P/PM

	※1	※2
PAL	OPEN	SHORT
PAL-M	SHORT	OPEN

CX773A (SONY)

C-MOS SYNC GENERATOR (NTSC, PAL-M, PAL, SECAM)

—TOP VIEW—



O/E : ODD/EVEN FIELD
CF : COLOUR FRAME PULSE
HCOM : H COMPARATOR

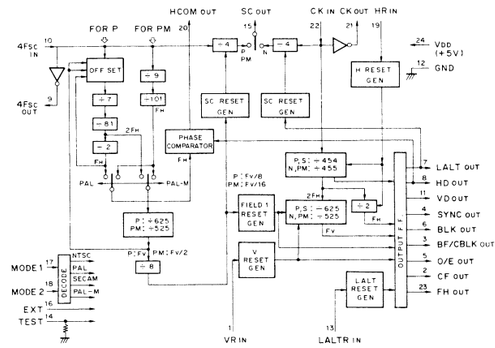
SYSTEM	4Fsc	CLOCK
NTSC	910 FH	910FH
PAL	1135FH+2FV	908FH
PALM	909FH	910FH
SECAM	———	908FH

INTUPS MODE 1	INTUPS MODE 2	SYSTEM
0	0	NTSC
0	1	SECAM
1	0	PALM
1	1	PAL

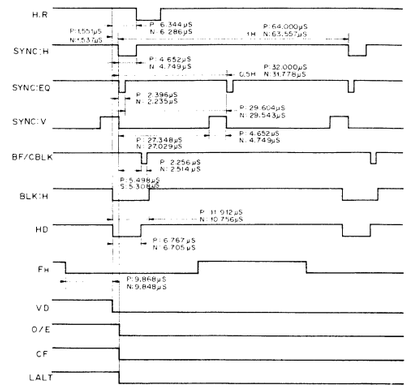
"1" VDD
"0" GND

INTUPS EXT	INTUPS TEST	FUNCTION
0	0	INTERNAL
0	1	INVALID
1	0	EXT
1	1	TEST

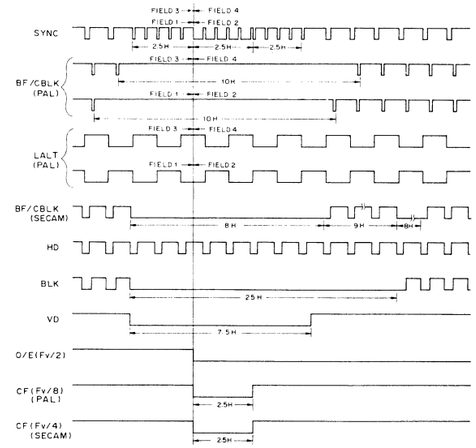
TEST "0" OPEN
(INTERNALLY PULLED DOWN)



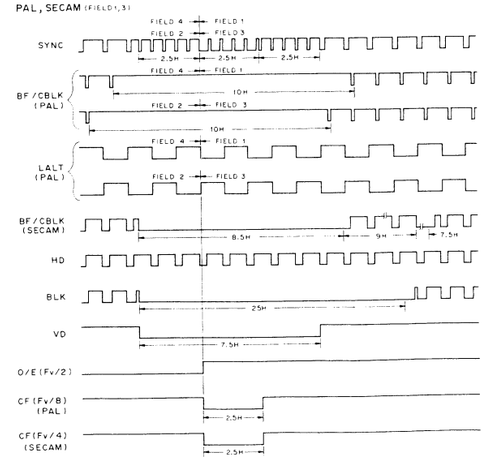
P: PAL, SECAM
N: NTSC, PALM

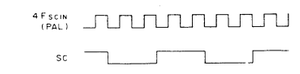


PAL, SECAM (FIELD 4, 2)

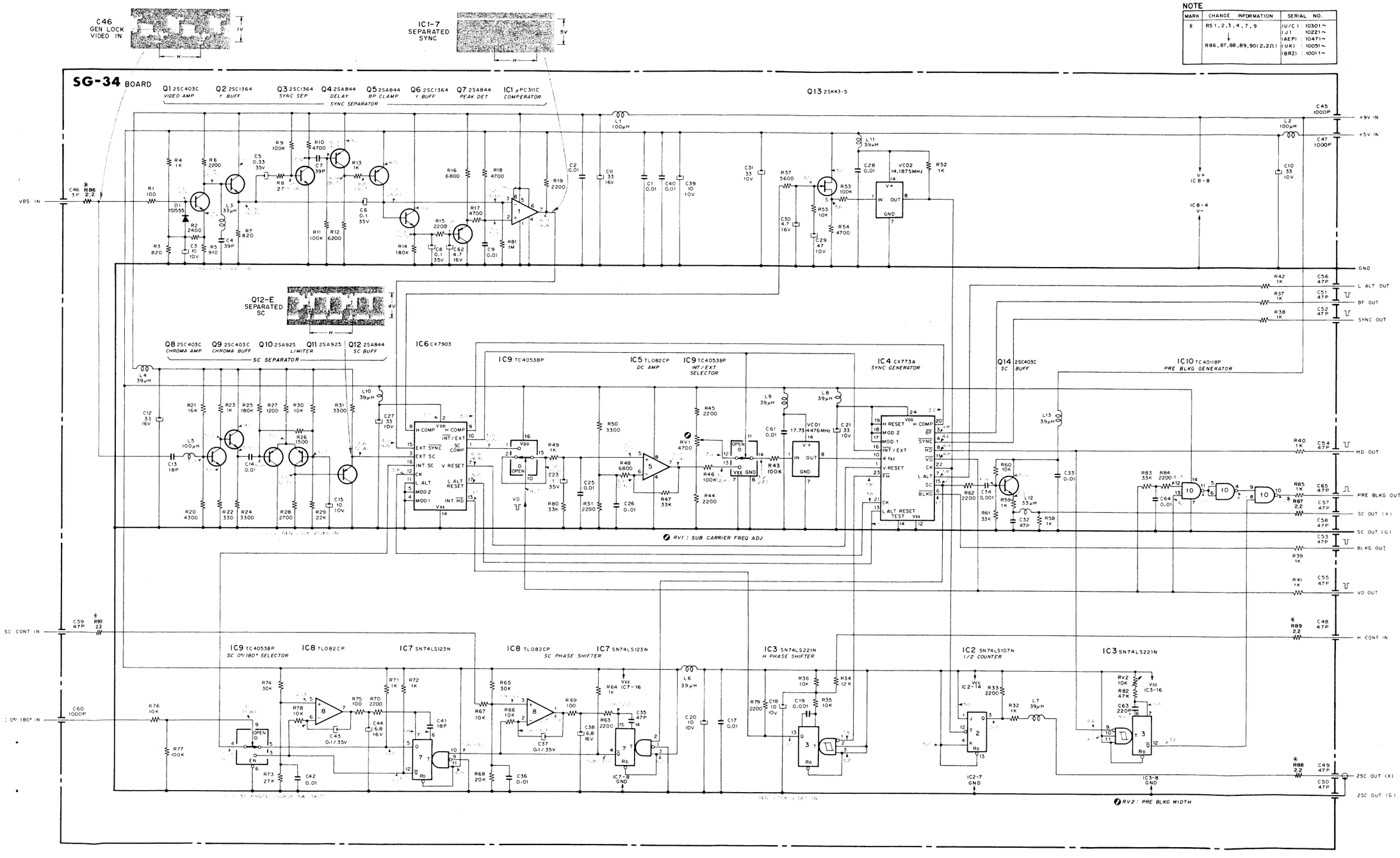


PAL, SECAM (FIELD 1, 3)





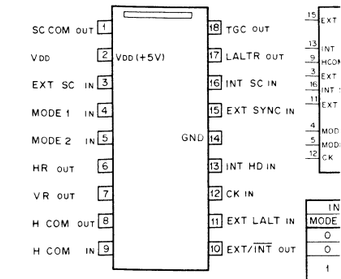
4 BOARD (SYNC GENERATOR SYSTEM)
CRK-2000P/PM use]



NOTE

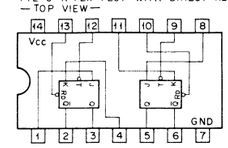
MARK	CHANGE INFORMATION	SERIAL NO.
*	R51,2,3,4,7,9	(U/C) : 10301~
	↓	(J) : 10221~
	R86,87,88,89,90(2.2Ω)	(AEP) : 10471~
		(UK) : 10051~
		(BRZ) : 10011~

CX7903 (SONY)
CMOS GENLOCK DRIVER FOR CX773
— TOP VIEW —



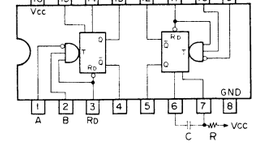
IN	
MODE	
0	
1	
1	

SN74LS107N (TI)
TTL J-K FLIP FLOP WITH DIRECT RESET
— TOP VIEW —



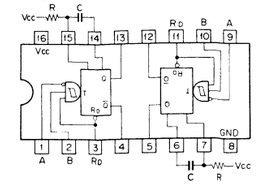
INPUTS		
RD	T	J
L	X	X
H	↓	L
H	↓	H
H	↑	L
H	↑	H
H	H	X

SN74LS123N (TI)
TTL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR WI
— TOP VIEW —



OUTPUT

SN74LS221N (TI)
TTL MONOSTABLE MULTIVIBRATOR WITH SCHMITT TRIGG
— TOP VIEW —

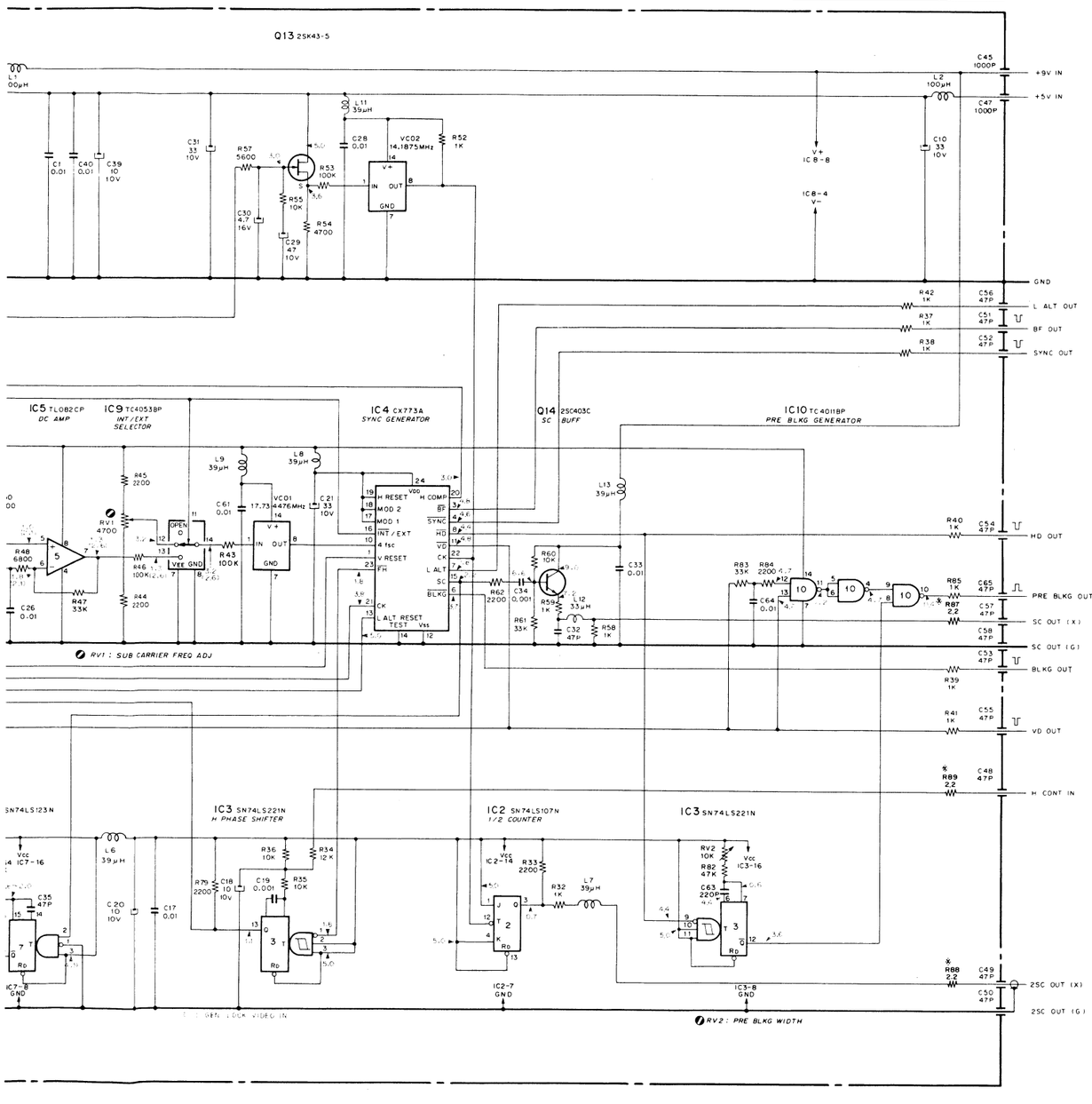


INPUT		
Rd	A	
L	X	
X	H	
X	X	
H	↓	
H	↑	

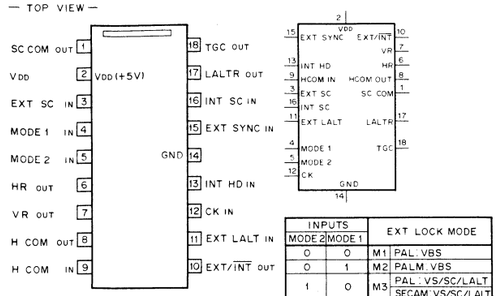
OUTPUT PU

NOTE

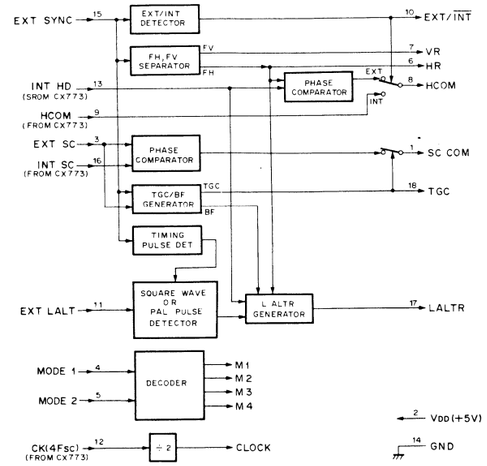
MARK	CHANGE INFORMATION	SERIAL NO.
※	RS1,2,3,4,7,9 ↓ R86,87,88,89,90(2.2Ω)	(U/C) : 10301~ (J) : 10221~ (AEP) : 10471~ (UK) : 10051~ (BRZ) : 10011~



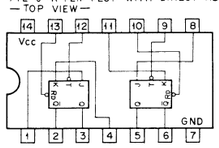
CX7903 (SONY)
CMOS GENLOCK DRIVER FOR CX773
— TOP VIEW —



INPUTS		EXT LOCK MODE	
MODE 2	MODE 1		
0	0	M1	PAL: VBS
0	1	M2	PALM: VBS
1	0	M3	PAL: VS/SC/LALT SECAM: VS/SC/LALT
1	1	M4	NTSC: VBS NTSC: VS/SC PALM: VS/SC/LALT

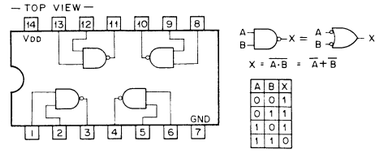


SN74LS107N (TI)
TTL J-K FLIP FLOP WITH DIRECT RESET
— TOP VIEW —



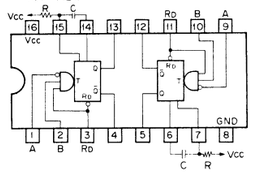
INPUTS				OUT
RD	T	J	K	Qn+1
L	X	X	X	L
H	↓	L	L	Qn
H	↓	L	H	L
H	↓	H	L	H
H	↓	H	H	$\overline{Qn}$
H	H	X	X	Qn

TC4011BP (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —



A	B	X
0	0	1
0	1	1
1	0	1
1	1	0

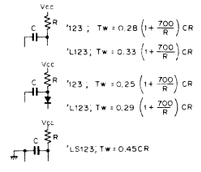
SN74LS123N (TI)
TTL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR WITH DIRECT RESET
— TOP VIEW —



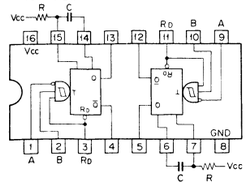
INPUTS			OUTPUTS	
RD	A	B	Q	$\overline{Q}$
0	X	X	0	1
X	1	X	0	1
X	X	1	0	1
1	0	↑	⊓	⊔
1	↓	↑	⊓	⊔
↑	0	1	⊓	⊔

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

OUTPUT PULSE WIDTH



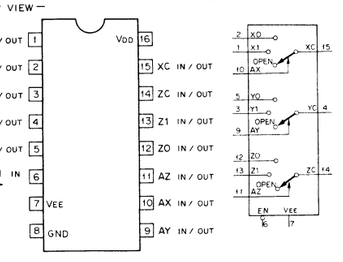
SN74LS221N (TI)
TTL MONOSTABLE MULTIVIBRATOR WITH SCHMITT TRIGGER INPUT
— TOP VIEW —



INPUTS			OUTPUTS	
RD	A	B	Q	$\overline{Q}$
L	X	X	L	H
X	H	X	L	H
X	X	L	L	H
H	L	↑	⊓	⊔
H	↓	H	⊓	⊔
↑	L	H	⊓	⊔

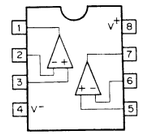
OUTPUT PULSE WIDTH = 0.7CR

TC4053BP (TOSHIBA)
C-MOS 2-CHANNEL MULTIPLEXER / DEMULTIPLEXER
— TOP VIEW —

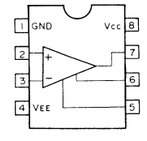


CONT. INPUTS		ON
EN	A (X,Y,Z)	CHANNEL
0	0	0
0	1	1
1	X	OPEN

TL082CP (TI)
OPERATIONAL AMPLIFIER
(JFET-INPUT)
— TOP VIEW —



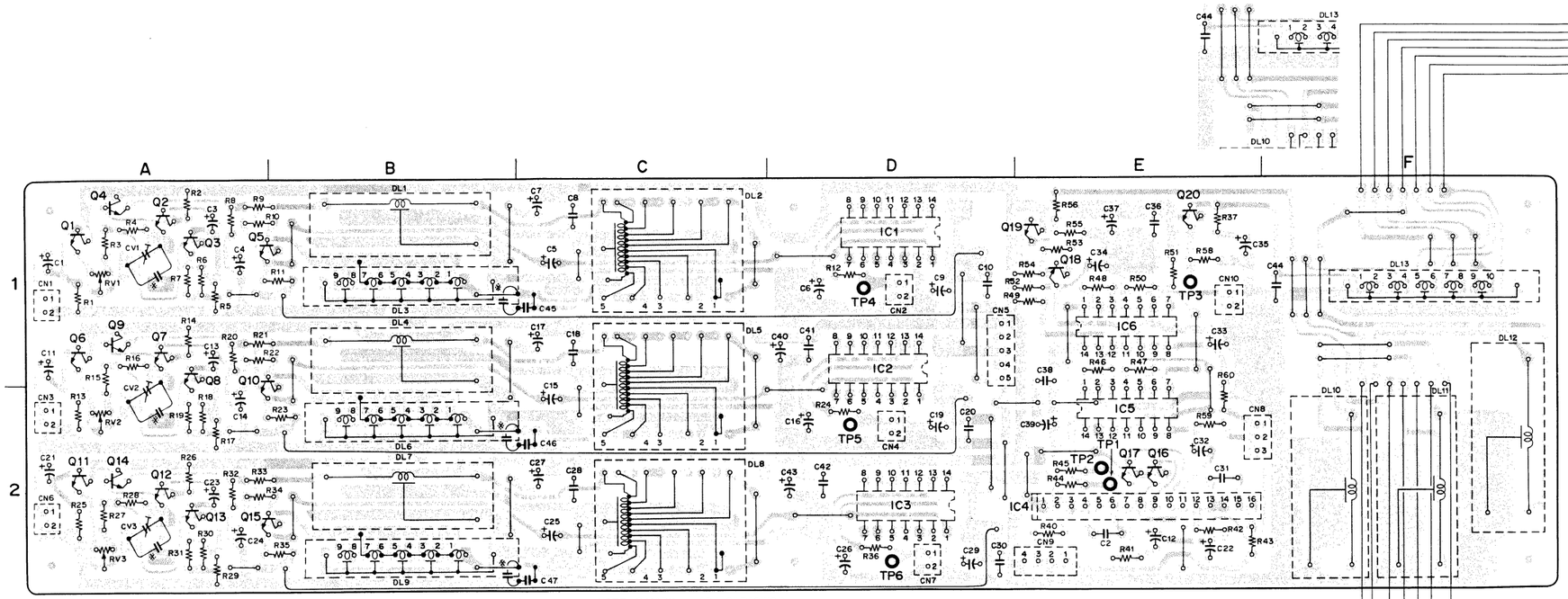
μPC311C (NEC)
VOLTAGE COMPARATOR
— TOP VIEW —



CT-41, SW-4/5

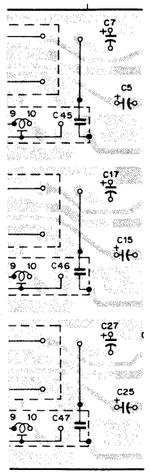
CT-41, SW-4/5 BOARD (CHROMA ENCODER, SPECIAL EFFECT VIDEO OUTPUT SYSTEM)

— SOLDERING SIDE —



NOTE ; ※ MARK ---- ADJ CAPACITOR

CN1	A · 1	DL8	C · 2	Q9	A · 1		
CN2	D · 1	DL9	B · 2	Q10	A · 1		
CN3	A · 2	DL10	F · 2	Q11	A · 2		
CN4	D · 2	DL11	F · 2	Q12	A · 2		
CN5	D · 1	DL12	F · 2	Q13	A · 2		
CN6	A · 2	DL13	F · 1	Q14	A · 2		
CN7	D · 2			Q15	A · 2		
CN8	E · 2	IC1	D · 1	Q16	E · 2		
CN9	E · 2	IC2	D · 1	Q17	E · 2		
CN10	E · 1	IC3	D · 2	Q18	E · 1		
		IC4	E · 2	Q19	E · 1		
CV1	A · 1	IC5	E · 2	Q20	E · 1		
CV2	A · 2	IC6	E · 1				
CV3	A · 2			RV1	A · 1		
		Q1	A · 1	RV2	A · 2		
DL1	B · 1	Q2	A · 1	RV3	A · 2		
DL2	C · 1	Q3	A · 1				
DL3	B · 1	Q4	A · 1	TP1	E · 2		
DL4	B · 1	Q5	A · 1	TP2	E · 2		
DL5	C · 1	Q6	A · 1	TP3	E · 1		
DL6	B · 2	Q7	A · 1	TP4	D · 1		
DL7	B · 2	Q8	A · 1	TP5	D · 2		
				TP6	D · 2		



CT-41 BOARD -11
- SOLDERING SIDE -

CRK-2000(J)	UP TO 10110
CRK-2000(U/C)	UP TO 10200
CRK-2000P(AEP)	UP TO 10190
CRK-2000P(UK)	UP TO 10010
CRK-2000PM(BRZ)	UP TO 10010

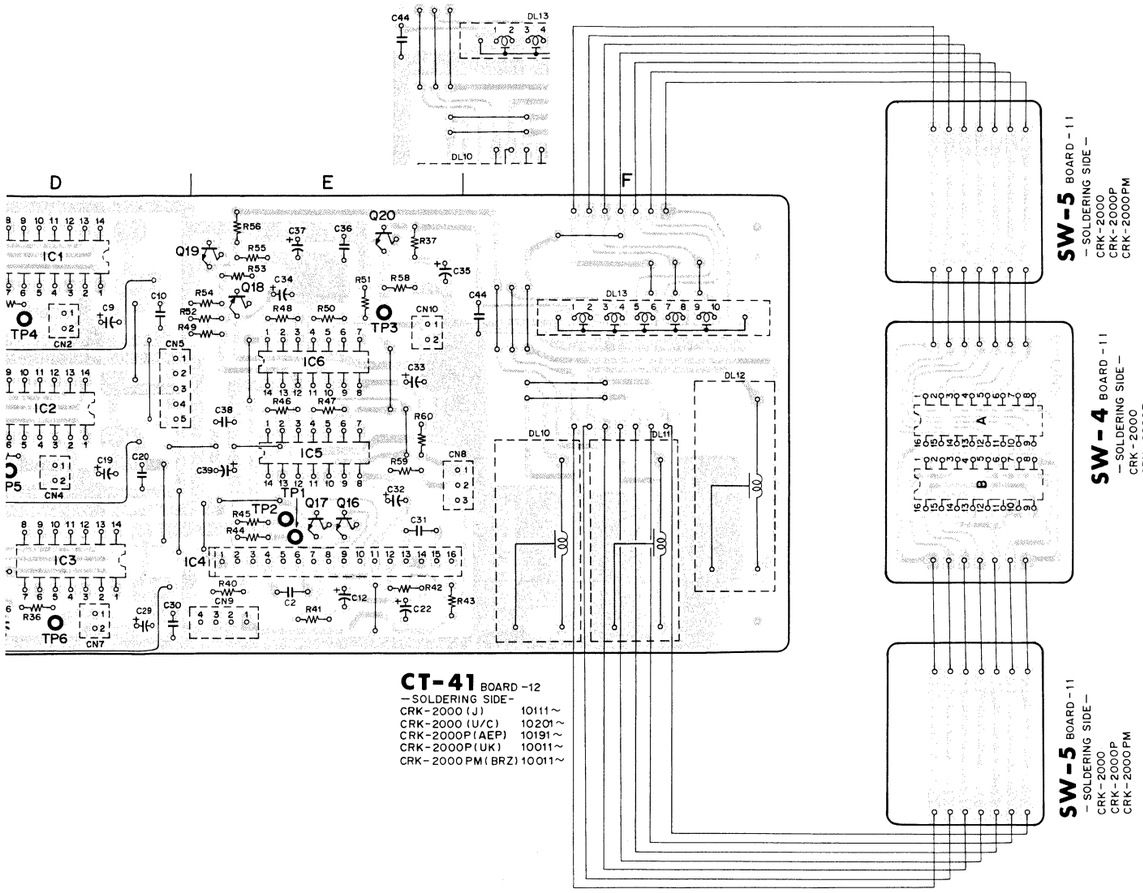
CT-41 BOARD -12
- SOLDERING SIDE -

CRK-2000(J)	10111~
CRK-2000(U/C)	10201~
CRK-2000P(AEP)	10191~
CRK-2000P(UK)	10011~
CRK-2000PM(BRZ)	10011~

SW-5 BOARD -11
- SOLDERING SIDE -
CRK-2000
CRK-2000P
CRK-2000PM

SW-4 BOARD -11
- SOLDERING SIDE -
CRK-2000
CRK-2000P
CRK-2000PM

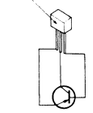
SW-5 BOARD -11
- SOLDERING SIDE -
CRK-2000
CRK-2000P
CRK-2000PM



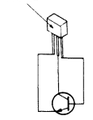
CT-41 BOARD -12
— SOLDERING SIDE —

CRK-2000 (J)	10111~
CRK-2000 (U/C)	10201~
CRK-2000P (AEP)	10191~
CRK-2000P (UK)	10011~
CRK-2000PM (BRZ)	10011~

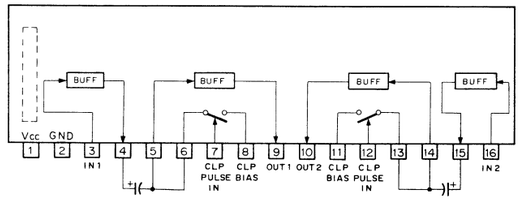
TYPE NO. PRINTED 2SA1175



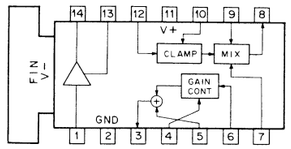
TYPE NO. PRINTED 2SC2785



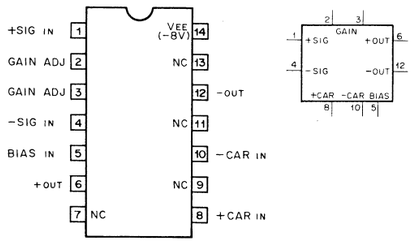
BX3992 (SONY)
DUAL CLAMPER
— REAR VIEW —



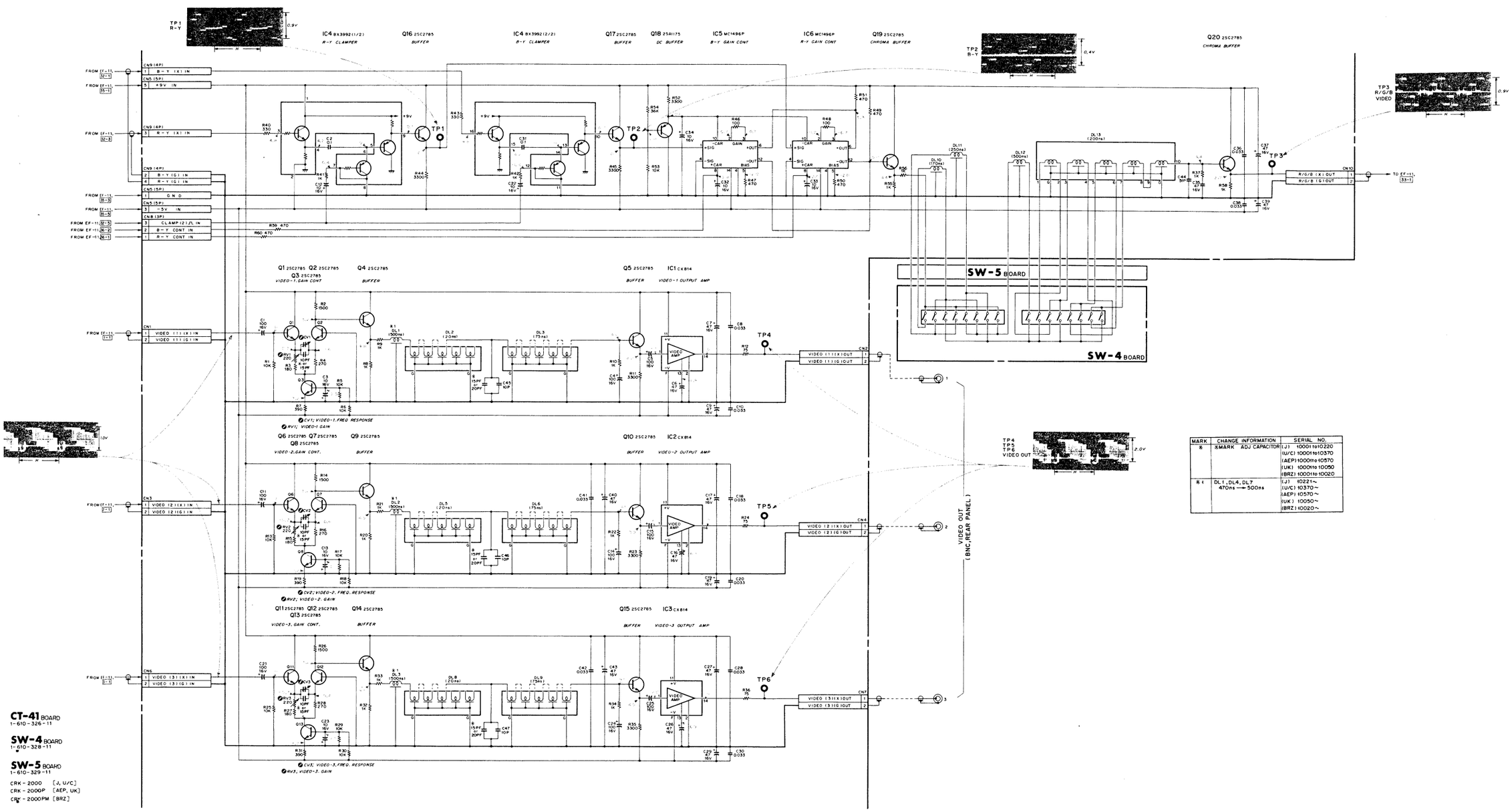
CX 814 (SONY)
— TOP VIEW —



MC1496P (MOTOROLA)
uA796PC (FSC)
BALANCED MODULATOR/DEMODULATOR
— TOP VIEW —



BOARD (CHROMA ENCODER, SPECIAL EFFECT VIDEO OUTPUT SYSTEM)


TP1 R-Y
0.9V
IC4 BX3992(1/2) R-Y CLAMPER
Q16 2SC2785 BUFFER
IC4 BX3992(2/2) B-Y CLAMPER
Q17 2SC2785 BUFFER
Q18 2SA1175 DC BUFFER
IC5 MC1496P B-Y GAIN CONT
IC6 MC1496P R-Y GAIN CONT
Q19 2SC2785 CHROMA BUFFER
TP2 B-Y
0.4V
Q20 2SC2785 CHROMA BUFFER
TP3 R/G/B VIDEO
0.9V
FROM EF-11, 32-1 CN9 (4P) 1 B-Y (X) IN
FROM EF-11, 35-1 CN5 (5P) 5 +9V IN
FROM EF-11, 32-3 CN9 (4P) 3 R-Y (X) IN
CN9 (4P) 2 B-Y (G) IN 4 R-Y (G) IN
FROM EF-11, 35-3 CN5 (5P) 1 G.N.D
FROM EF-11, 35-5 CN5 (5P) 3 -5V IN
FROM EF-11, 32-5 CN8 (3P) 3 CLAMP (2) /L IN
FROM EF-11, 26-2 2 B-Y CONT IN
FROM EF-11, 26-1 1 R-Y CONT IN
R60 470
SW-5 BOARD
SW-4 BOARD
TO EF-11, 33-1 CN10 R/G/B (X) OUT R/G/B (G) OUT
Q1 2SC2785 Q2 2SC2785 Q3 2SC2785 VIDEO-1 GAIN CONT
Q4 2SC2785 BUFFER
Q5 2SC2785 BUFFER
IC1 CXB14 VIDEO-1 OUTPUT AMP
FROM EF-11, 1-1 CN1 1 VIDEO (1) (X) IN 2 VIDEO (1) (G) IN
RV1 220
RV1; VIDEO-1 GAIN
CV1; VIDEO-1 FREQ RESPONSE
TP4
CN2 VIDEO (1) (X) OUT VIDEO (1) (G) OUT
Q6 2SC2785 Q7 2SC2785 Q8 2SC2785 VIDEO-2 GAIN CONT.
Q9 2SC2785 BUFFER
Q10 2SC2785 BUFFER
IC2 CXB14 VIDEO-2 OUTPUT AMP
FROM EF-11, 2-1 CN3 1 VIDEO (2) (X) IN 2 VIDEO (2) (G) IN
RV2 220
CV2; VIDEO-2 FREQ. RESPONSE
RV2; VIDEO-2 GAIN
TP5
CN4 VIDEO (2) (X) OUT VIDEO (2) (G) OUT
Q11 2SC2785 Q12 2SC2785 Q13 2SC2785 VIDEO-3 GAIN CONT.
Q14 2SC2785 BUFFER
Q15 2SC2785 BUFFER
IC3 CXB14 VIDEO-3 OUTPUT AMP
FROM EF-11, 3-1 CN6 1 VIDEO (3) (X) IN 2 VIDEO (3) (G) IN
RV3 220
CV3; VIDEO-3 FREQ. RESPONSE
RV3; VIDEO-3 GAIN
TP6
CN7 VIDEO (3) (X) OUT VIDEO (3) (G) OUT
VIDEO OUT (BNC, REAR PANEL)
TP4 TP5 TP6 VIDEO OUT
2.0V

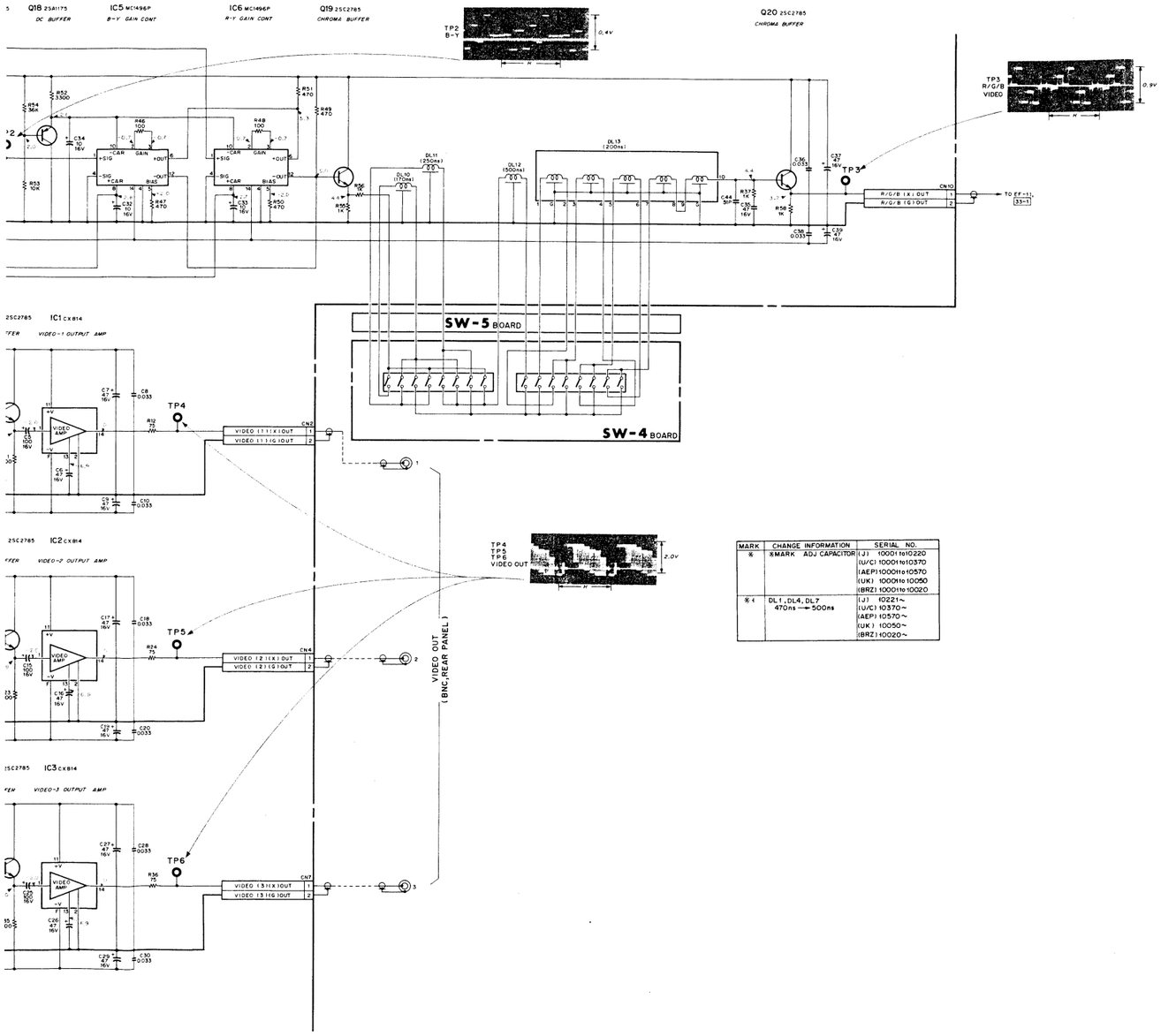
MARK	CHANGE INFORMATION	SERIAL NO.
※	※MARK ADJ CAPACITOR	(J) 10001 to 10220
		(U/C) 10001 to 10370
		(AEP) 10001 to 10570
		(UK) 10001 to 10050
		(BRZ) 10001 to 10020
※※	DL1, DL4, DL7 470ns → 500ns	(J) 10221～
		(U/C) 10370～
		(AEP) 10570～
		(UK) 10050～
		(BRZ) 10020～

CT-41 BOARD
1-610-326-11

SW-4 BOARD
1-610-328-11

SW-5 BOARD
1-610-329-11

CRK-2000 [J, U/C]
CRK-2000P [AEP, UK]
CRK-2000PM [BRZ]



MARK	CHANGE INFORMATION	SERIAL NO.
※	※MARK ADJ CAPACITOR	(J) 10001 to 10220
		(U/C) 10001 to 10370
		(AEP) 10001 to 10570
		(UK) 10001 to 10050
		(BRZ) 10001 to 10020
※1	DL1, DL4, DL7 470ns → 500ns	(J) 10221~
		(U/C) 10370~
		(AEP) 10570~
		(UK) 10050~
		(BRZ) 10020~

BOARD
BOARD
BOARD
BOARD
BOARD
BOARD
DERING SIDE —

SERIAL No.
J : up to 10220
U/C : up to 10470
AEP : up to 10820
UK : up to 10060
BRZ : up to 10020

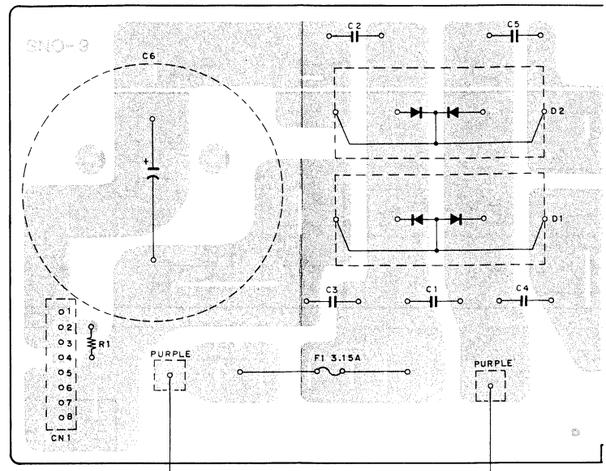
CT-18 BOARD-11
—SOLDERING SIDE—
CRK-2000
CRK-2000P
CRK-2000PM

SW-21 BOARD-12
—SOLDERING SIDE—
CRK-2000
CRK-2000P
CRK-2000PM

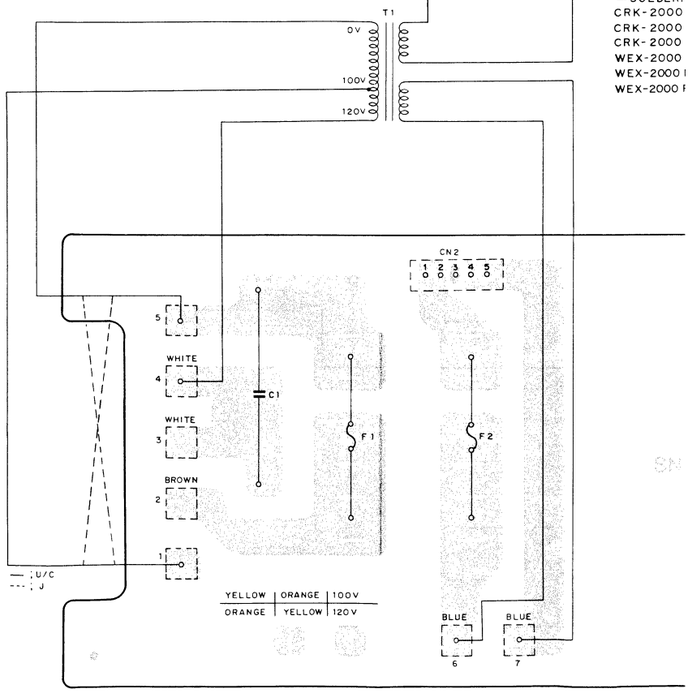
SW-90 BOARD-11
—SOLDERING SIDE—
CRK-2000
CRK-2000P
CRK-2000PM

S5151

S5151R

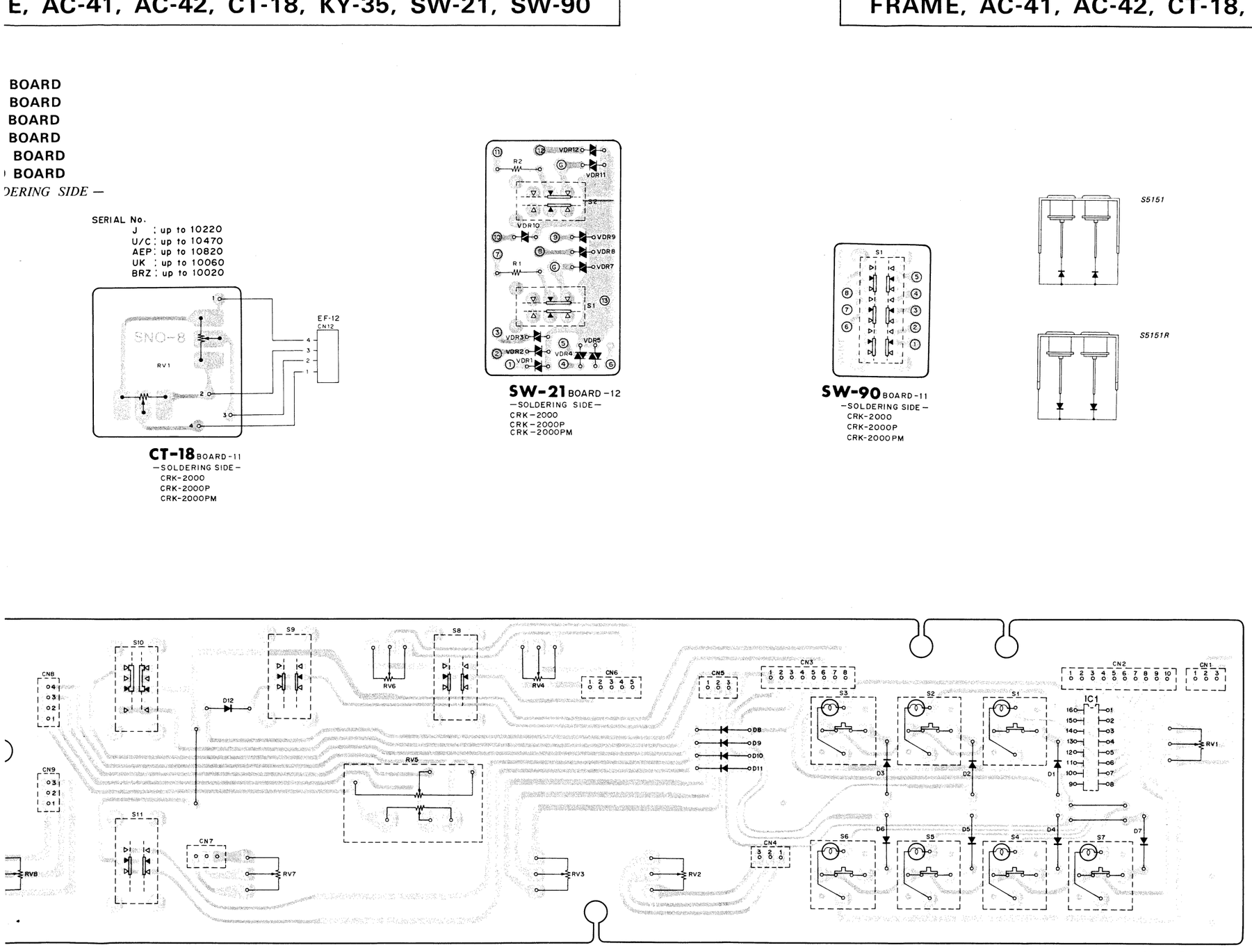


AC-42
—SOLDERI
CRK-2000
CRK-2000
CRK-2000
WEX-2000
WEX-2000
WEX-2000



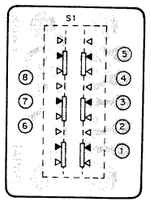
AC-4
—SOLDE
CRK-2C

AC BOAF

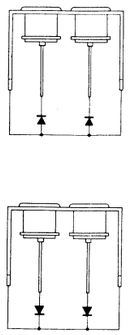


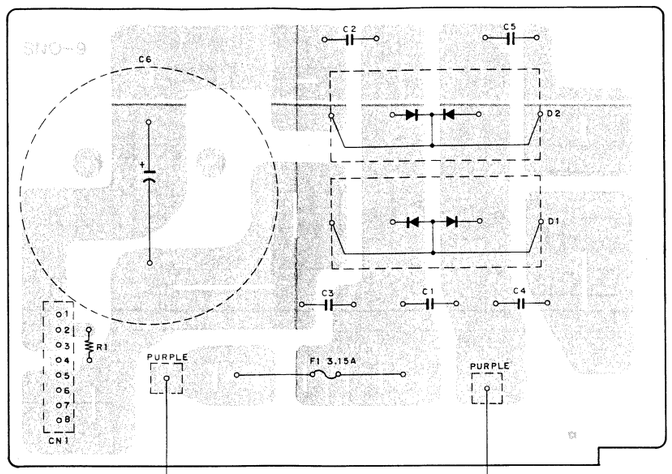
KY-35 BOARD-11,12
—SOLDERING SIDE—
CRK-2000
CRK-2000P
CRK-2000PM

FRAME, AC-41, AC-42, CT-18, KY-35, SW-21, SW-90

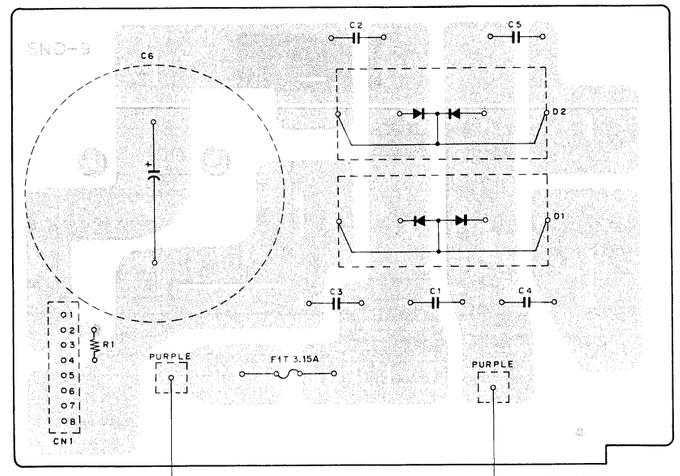


SW-90 BOARD-11
– SOLDERING SIDE –
CRK-2000
CRK-2000P
CRK-2000PM

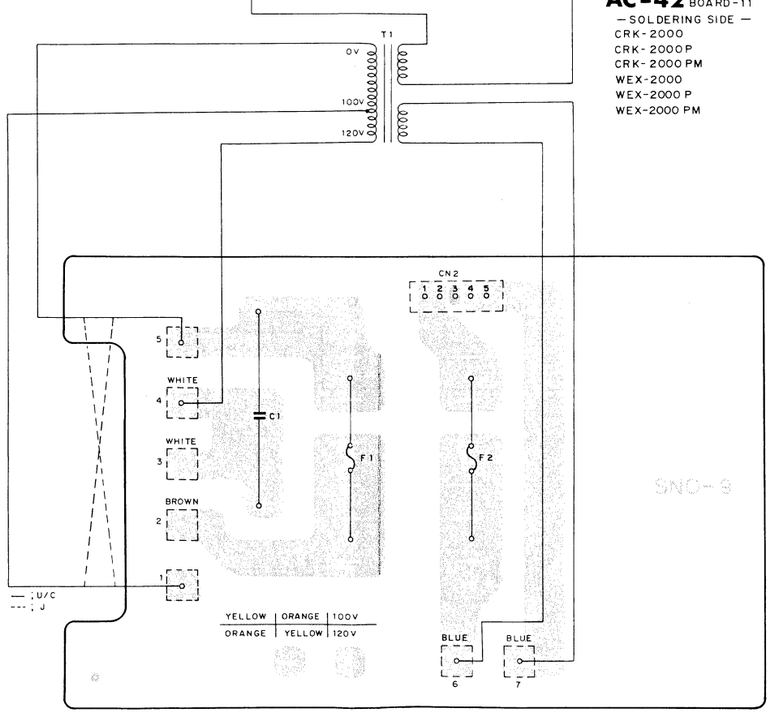




AC-42 BOARD-11
– SOLDERING SIDE –
CRK-2000
CRK-2000P
CRK-2000PM
WEX-2000
WEX-2000P
WEX-2000PM

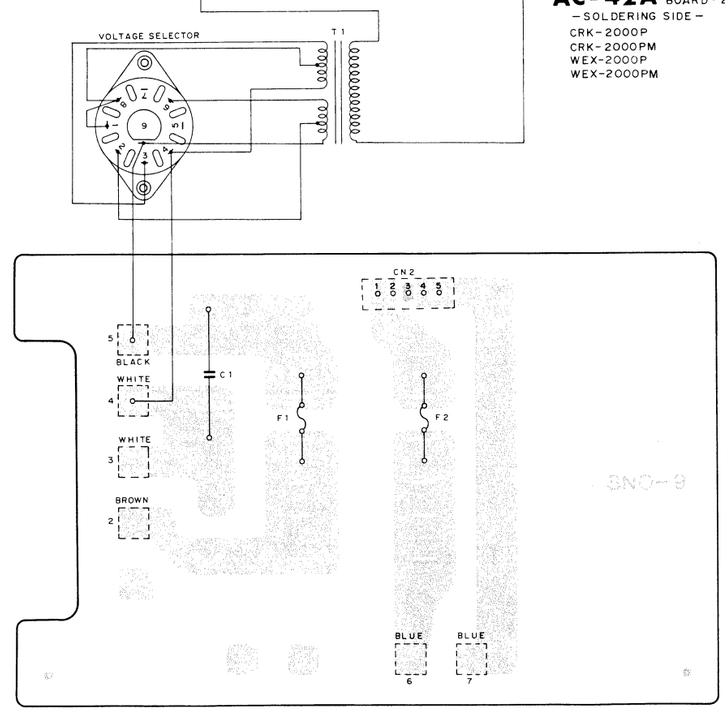


AC-42A BOARD-21,22
– SOLDERING SIDE –
CRK-2000P
CRK-2000PM
WEX-2000P
WEX-2000PM



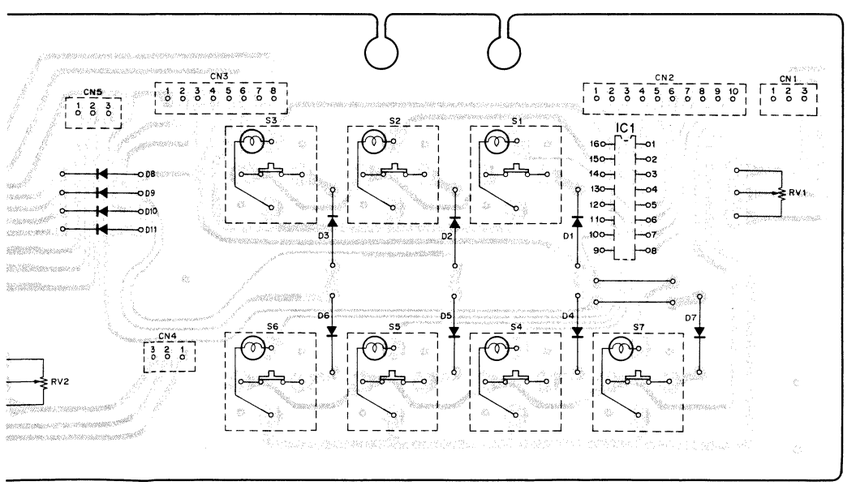
AC-41 BOARD-11,12
– SOLDERING SIDE –
CRK-2000

AC BOARD (NTSC)



AC-41A BOARD-21,22
– SOLDERING SIDE –
CRK-2000P
CRK-2000PM

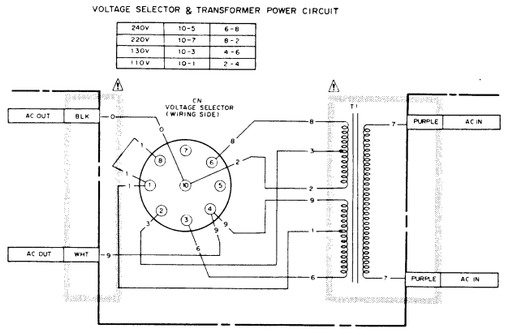
AC BOARD (PAL, PAL-M)



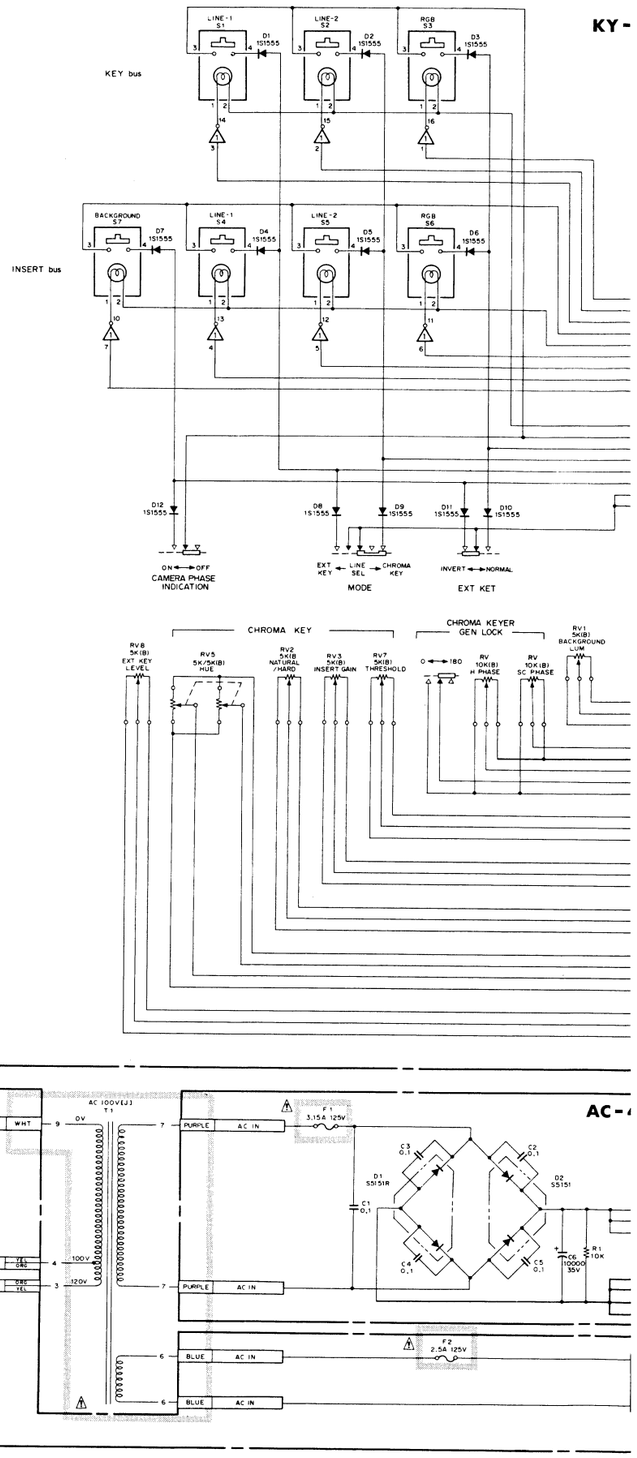
KY-35 BOARD-11,12
– SOLDERING SIDE –
CRK-2000
CRK-2000P
CRK-2000PM

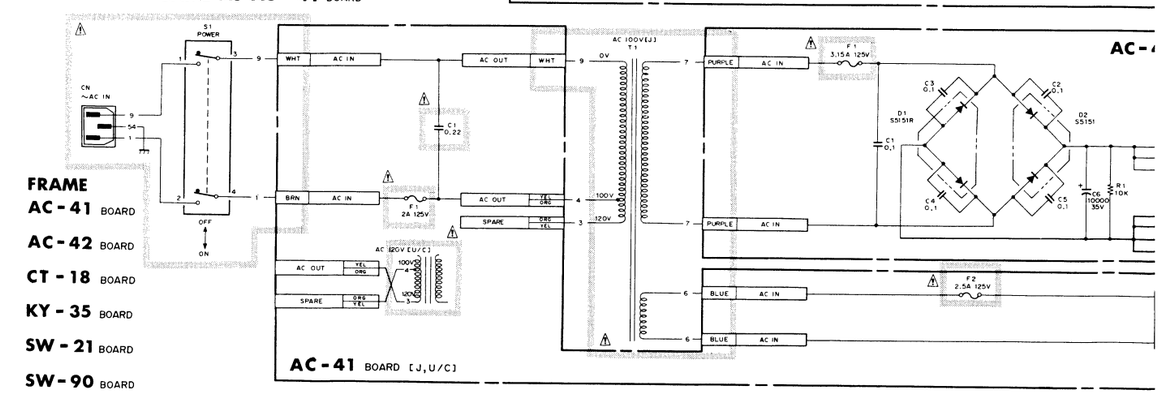
FRAME, AC-41, AC-42, CT-18, KY-35, SW-21, SW-90

CRK FRAME
AC-41 BOARD
AC-42 BOARD
CT-18 BOARD
KY-35 BOARD
SW-21 BOARD
SW-90 BOARD



AC-41A BOARD (AEP,UK,BRZ)
SAME AS AC-41 BOARD





AC-41 BOARD [J,U/C]

FRAME
AC-41 BOARD
AC-42 BOARD
CT-18 BOARD
KY-35 BOARD
SW-21 BOARD
SW-90 BOARD

CRK-2000 [J,U/C]
CRK-2000P [AEP,UK]
CRK-2000PM [BRZ]

FRAME, AC-41, AC-42, CT-18, KY-35, SW-21, SW-90

CP-55 BOARD

KY-35 BOARD

EF-12 BOARD

EF-11 BOARD

AC-42 BOARD

CT-41 BOARD

SW-90 BOARD

SW-21 BOARD

CAMERA TALLY / INTERCOM

SEG TALLY / INTERCOM

CHROMA KEY TALLY

VIDEO IN

VIDEO OUT

CHROMA KEY OUT

BLACK BURST OUT

EXT KEY

B/W CAMERA

GEN LOCK

※DELETE CT-18 BOARD
SERIAL NO. J : UP to 10220
U/C : UP to 10470
AEP : UP to 10820
UK : UP to 10060
BRZ : UP to 10020

The shaded and ⚠-marked components are critical to safety.
Replace only with same components as specified.

SECTION 11

11-1. PARTS INFORMATION

1. **Safety Related Component Warning**

   Components identified by shading marked with ⚠ on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose parts numbers appear as shown in this manual or in service bulletins and service manual supplements published by Sony.

2. Replacement Parts supplied from Sony Parts Center will sometimes have different shape and outside view from the parts which actually in use. This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts."
   - This manual's exploded views and electrical spare parts list are indicating the parts numbers of "the standardized genuine parts at present".
   - Regarding engineering parts changes in our engineering department, refer Sony service bulletins and service manual supplements.

3. **Printed Components in Bold-Face type** on the exploded views and electrical spare parts list are normally stocked for replacement purposes. The remaining parts are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

4. Item with no part number and/or no description are not stocked because they are seldom required for routine service.

5. **Fixing Screw, Stop Ring and Others**

(1) All the screws used in this machine are the TOTSU type unless otherwise noted. The screws are interchangeable with the Phillips type (+) and slotted type (−) screws.
(2) Please order as the following parts number when ordering the fixing screws, stop rings, and others.

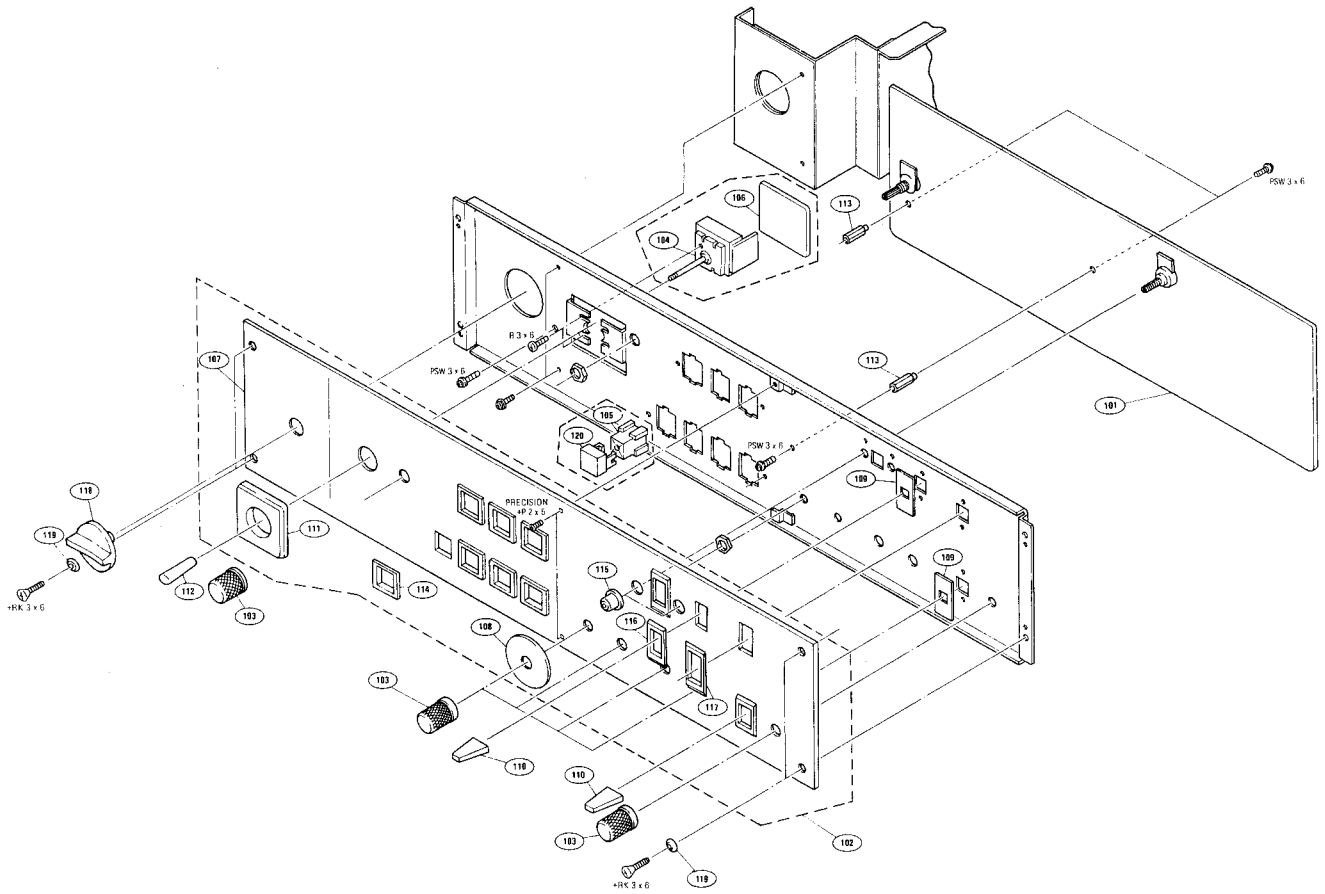
TOTSU TYPE

	B	P	PS	PSW
2.6 x 4	7-621-912-10	———	7-621-972-05	———
2.6 x 8	7-621-912-40	7-621-909-55	7-621-972-35	———
3 x 4	7-682-545-09	———	———	———
3 x 6	7-682-624-09	———	7-686-447-01	7-686-527-01
3 x 8	7-686-625-09	———	7-686-448-01	7-686-528-01
4 x 8	7-686-635-04	———	———	7-686-961-01

TOTSU TYPE

	P (PRECISION)	P	RK
2 x 5	7-627-533-67	———	———
2.6 x 4	7-627-556-37	———	———
2 x 10	———	7-628-253-45	———
3 x 6	———	———	7-682-347-09
3 x 8	———	———	7-682-348-04

11-2. EXPLODED VIEW
FRONT PANEL BLOCK



No.	Parts No.	Description
101	A-7511-977-A	MOUNTED CIRCUIT BOARD "KY-35"
102	A-7605-056-A	CONTROL PANEL ASSY (NTSC)
	A-7605-057-A	CONTROL PANEL ASSY (PAL)
	A-7605-058-A	CONTROL PANEL ASSY (PM)
103	**X-3661-073-0**	**KNOB, VOL ASSY**
104	**1-226-342-00**	**CARBON 5K "BACKGROUND COLOR" (RV1)**
105	**1-518-450-11**	**PILOT LAMP**
106	1-606-082-00	PRINTED CIRCUIT BORAD "CT-18"
107	2-382-121-00	PANEL, CONTROL
108	2-382-128-00	LABEL, COULOR LING
109	2-249-363-00	PLATE, LEVER, SWITCH
110	**2-252-620-00**	**KNOB, LEVER SWITCH**

No.	Parts No.	Description
111	2-254-713-21	COVER, JOYSTICK
112	**2-296-508-00**	**KNOB, JOYSTICK**
113	2-296-523-00	STUD (1), PCB
114	2-296-534-00	ESCUTHEON (12), BUTTON
115	3-664-227-00	ESCUTHEON, CONTROL
116	3-668-016-00	FRAME (SMALL), ORNAMENTAL
117	3-668-018-00	FRAME (MIDDLE), ORNAMENTAL
118	**4-858-419-11**	**KNOB, SELECTOR**
119	**3-703-224-00**	**WASHER (3 DIA.), ORANMENTAL**
120	**3-706-480-01**	**KEY TOP**

NOTE:

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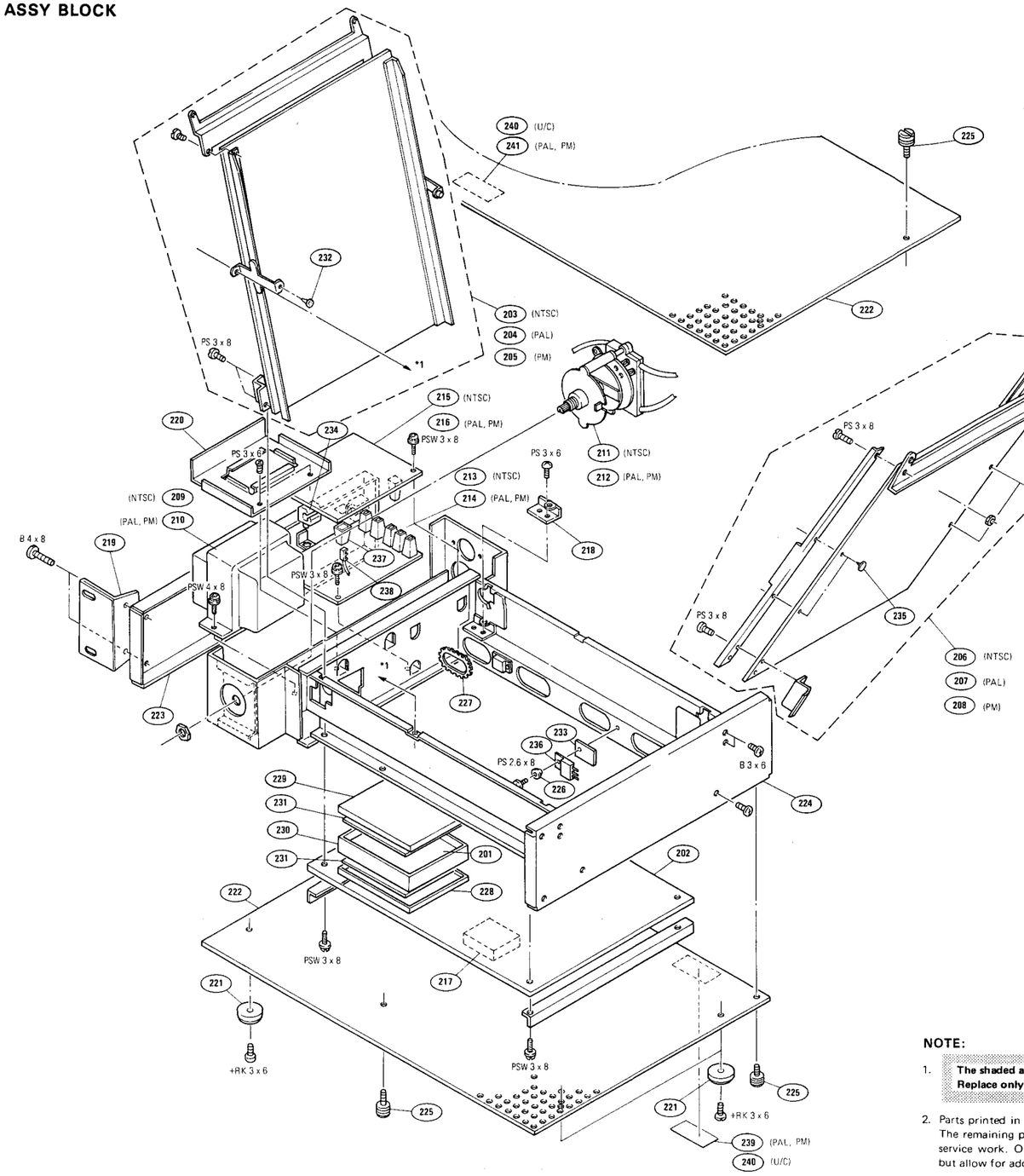
2. Item with no part number and/or no description are not stocked because they are seldom required for routine service.

CHASSIS ASSY BLOCK

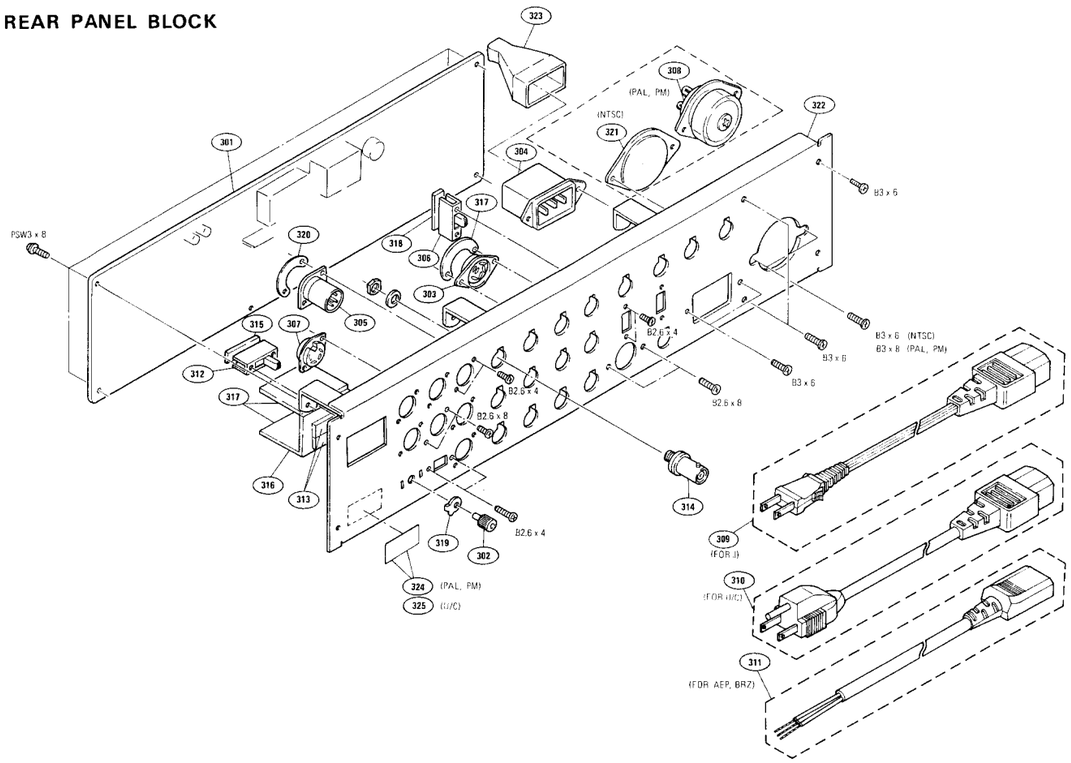


NOTE:

1. **The shaded and ⚠ -marked components are critical to safety. Replace only with same components as specified.**
2. Parts printed in Bold-Face type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
3. Item with no part number and/or no description are not stocked because they are seldom required for routine service.

No.	Parts No.	Description
201	A-7511-518-A	MOUNTED CIRCUIT BOARD "SG-35"
202	A-7615-127-A	MOUNTED CIRCUIT BOARD "CP-55"
203	A-7615-121-A	MOUNTED CIRCUIT BOARD "EF-11" (NTSC)
204	A-7615-122-A	MOUNTED CIRCUIT BOARD "EF-11" (PAL)
205	A-7615-123-A	MOUNTED CIRCUIT BOARD "EF-11" (PM)
206	A-7615-124-A	MOUNTED CIRCUIT BOARD "EF-12" (NTSC)
207	A-7615-125-A	MOUNTED CIRCUIT BOARD "EF-12" (PAL)
208	A-7615-126-A	MOUNTED CIRCUIT BOARD "EF-12A" (PM)
⚠ **209**	**1-447-634-00**	**TRANSFORMER, POWER (PAL, PM)**
⚠ **210**	**1-447-635-00**	**TRANSFORMER, POWER (NTSC)**
⚠ **211**	**1-554-555-11**	**SWITCH ASSY, ROTARY POWER (S1) (NTSC)**
212	**1-554-555-21**	**SWITCH ASSY, ROTARY POWER (S1) (PAL, PM)**
213	1-610-324-11	PRINTED CIRCUIT BOARD "AC-42" (NTSC)
214	1-610-324-21	PRINTED CIRCUIT BOARD "AC-42A" (PAL, PM)
215	1-610-330-11	PRINTED CIRCUIT BOARD "AC-41" (NTSC)
216	1-610-330-21	PRINTED CIRCUIT BOARD "AC-41A" (PAL, PM)
217	2-279-520-00	CUSHION
218	2-382-104-00	STOPPER
219	2-382-107-00	ANGLE
220	2-382-108-00	HOLDER, TRANSFORMER
221	2-382-110-00	LEG
222	2-382-116-00	COVER
223	2-382-124-02	PANEL (LEFT), SIDE
224	2-381-125-02	PANEL (RIGHT), SIDE
225	**2-382-129-01**	**SCREW (M3x6), BW**
226	**2-832-007-00**	**BUSHING (K), INSULAING**
227	**3-512-114-00**	**BUSH**
228	3-664-242-00	LID, LOWER, SG SHIELD
229	3-664-243-00	LID, UPPER, SG SHIELD
230	3-664-244-00	CASE, SHIELD, SG
231	3-664-245-00	INSULATOR
232	**3-701-188-XX**	**FOOT, RUBBER**
233	3-703-034-00	INSULATOR, TO-220
234	3-703-072-00	HOLDER, PC BOARD
235	**4-812-134-00**	**PIVET NYLON, 3.5**
236	**8-382-129-00**	**TRANSISTOR 2SB856 (Q101~104)**
237	1-509-921-00	PLUG, HOUSING
⚠ 238	1-535-047-00	PLUG, CONTACT
239	3-703-043-21	LABEL, CAUTION MAIN (FOR PAL, PM)
240	3-703-848-01	LABEL, (N) SUB CAUTION (FOR U/C)
241	3-703-082-21	LABEL, CAUTION SUB (FOR PAL, PM)

REAR PANEL BLOCK



No.	Parts No.	Description
301	A-7511-978-A	MOUNTED CIRCUIT BOARD "CT-41"
302	**X-2068-004-0**	**EARTH TERMINAL**
303	**1-509-422-XX**	**RECEPTACLE, 6P FEMALE "B/W CAMERA" (CN108)**
⚠ **304**	**1-509-546-00**	**3P INLET "~AC IN" (CN301)**
305	**1-509-501-00**	**RECEPTACLE, 4P, MALE (CN105~107)**
306	**1-516-576-00**	**SWITCH, SLIDE**
307	**1-526-531-00**	**RECEPTACLE, 4P, FEMALE (CN101~104)**
308	**1-526-572-21**	**VOLTAGE SELECT (PAL, PM)**
⚠ **309**	**1-534-754-15**	**POWER, CODE (FOR J)**
⚠ **310**	**1-551-812-00**	**POWER, CODE (FOR U/C)**
⚠ **311**	**1-556-760-00**	**POWER, CODE (FOR AEP, BRZ)**
312	**1-554-554-00**	**SWITCH, SLIDE "LOCAL REMOTE" (S1)**
313	**1-554-556-00**	**SWITCH, ROCKER "RGB DELAY" (S1, S2)**
314	**1-561-781-21**	**RECEPTACLE, BNC**
315	1-610-327-00	PRITED CIRCUIT BOARD "SW-90"
316	1-610-328-00	PRITED CIRCUIT BOARD "SW-4"
317	1-610-329-00	PRITED CIRCUIT BOARD "SW-5"
318	1-610-436-00	PRITED CIRCUIT BOARD "SW-21"
319	**2-068-008-00**	**WASHER**
320	**2-070-339-00**	**NUT, PLATE**
321	2-228-109-00	LID, MASKING (NTSC)
322	2-382-122-00	PANEL, REAR
323	4-601-466-00	COVER, 3P INLET
324	3-703-082-21	LABEL, CAUTION SUB (FOR PAL, PM)
325	3-703-845-01	LABEL(N) MAIN CAUTION (FOR U/C)

NOTE:

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2. Parts printed in Bold-Face type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
3. Item with no part number and/or no description are not stocked because they are seldom required for routine service.

11-3. ELECTRICAL PARTS LIST

ABBREVIATION

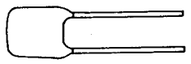
Ref. No.	DESCRIPTION	Ref. No.	DESCRIPTION	Ref. No.	DESCRIPTION
C	CAPACITOR	FL	FILTER	RY	RELAY
CN	CONNECTOR	IC	IC	S	SWITCH
CV	VARIABLE CAPACITOR	L	INDUCTOR	T	TRANSFORMER
D	DIODE	Q	TRANSISTOR	TH	THERMISTOR
DL	DELAY LINE	R	RESISTOR	VDR	VARISTOR
F	FUSE	RV	VARIABLE RESISTOR	X	CRTSTAL

All capacitors are in micro farads unless otherwise specified.
All inductors are in micro henries unless otherwise specified.
All resistors are in ohms.

Parts that are not listed in the "reference numbers order list" are shown in following table.
Reference numbers are omitted.

CAPACITOR

MYLAR CAPACITOR



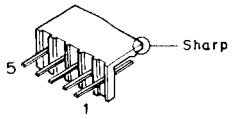
0.00047μF through 0.22μF
±5% 50WV

Parts No. 1-130-□□□-00

Value	Parts No. –□□□–	Value	Parts No. –□□□–	Value	Parts No. –□□□–
0.00047μF	467	0.0039μF	478	0.033μF	489
0.00056	468	0.0047	479	0.039	490
0.00068	469	0.0056	480	0.047	491
0.00082	470	0.0068	481	0.056	492
0.001	471	0.0082	482	0.068	493
0.0012	472	0.01	483	0.082	494
0.0015	473	0.012	484	0.1	495
0.0018	474	0.015	485	0.12	496
0.0022	475	0.018	486	0.15	497
0.0027	476	0.022	487	0.18	498
0.0033	477	0.027	488	0.22	499

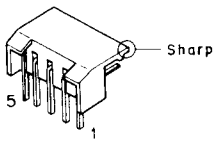
CONNECTOR

top-type receptacle



2P	1-560-356-00
3P	1-560-357-00
4P	1-560-358-00
5P	1-560-359-00
6P	1-560-360-00
8P	1-560-361-00
10P	1-560-362-00
12P	1-560-363-00

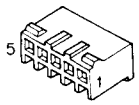
side-type receptacle



2P	1-560-364-00
3P	1-560-365-00
4P	1-560-366-00
5P	1-560-367-00
6P	1-560-368-00
8P	1-560-369-00
10P	1-560-370-00
12P	1-560-371-00

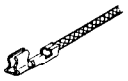
plug

housing



2P	1-561-514-00
3P	1-561-515-00
4P	1-561-516-00
5P	1-561-517-00
6P	1-561-518-00
8P	1-561-519-00
10P	1-561-520-00
12P	1-561-521-00

contact



1-560-372-00

R, CARBON

RESISTOR

CARBON RESISTOR (1/8W)

±5%, 1/8W, non-special type
2.2Ω through 1MΩ

Parts No. 1-246-□□□-00

Value	Parts No. -□□□-
1Ω	–
1.1	–
1.2	–
1.3	–
1.5	–
1.6	–
1.8	–
2	–
2.2	751
2.4	812
2.7	752
3	813
3.3	753
3.6	814
3.9	754
4.3	815
4.7	755
5.1	816
5.6	756
6.2	817
6.8	757
7.5	818
8.2	758
9.1	819
10Ω	759
11	820
12	760
13	821
15	761
16	822
18	762
20	823
22	763
24	824
27	764
30	825

Value	Parts No. -□□□-
33Ω	765
36	826
39	766
43	827
47	767
51	828
56	768
62	829
68	769
75	830
82	770
91	831
100Ω	771
110	832
120	772
130	833
150	773
160	834
180	774
200	835
220	775
240	836
270	776
300	837
330	777
360	838
390	778
430	839
470	779
510	840
560	780
620	841
680	781
750	842
820	782
910	843

Value	Parts No. -□□□-
1kΩ	783
1.1	844
1.2	784
1.3	845
1.5	785
1.6	846
1.8	786
2	847
2.2	787
2.4	848
2.7	788
3.0	849
3.3	789
3.6	850
3.9	790
4.3	851
4.7	791
5.1	852
5.6	792
6.2	853
6.8	793
7.5	854
8.2	794
9.1	855
10kΩ	795
11	856
12	796
13	857
15	797
16	858
18	798
20	859
22	799
24	860
27	800
30	861

Value	Parts No. -□□□-
33kΩ	801
36	862
39	802
43	863
47	803
51	864
56	804
62	865
68	805
75	866
82	806
91	867
100kΩ	807
110	868
120	808
130	869
150	809
160	870
180	810
200	871
220	811

Parts No. 1-247-□□□-00

Value	Parts No. -□□□-
240kΩ	054
270	046
300	055
330	047
360	056
390	048
430	057
470	049
510	058
560	050
620	059
680	051
750	060
820	052
910	061
1MΩ	053

CARBON RESISTOR (1/6W)

±5%, 1/6W, non-special type
2.2Ω through 1MΩ

Parts No. 1-247-□□□-00

Value	Parts No. −□□□−
1Ω	–
1.1	–
1.2	–
1.3	–
1.5	–
1.6	–
1.8	–
2	–
2.2	767
2.4	768
2.7	769
3	770
3.3	771
3.6	772
3.9	773
4.3	774
4.7	775
5.1	776
5.6	777
6.2	778
6.8	779
7.5	780
8.2	781
9.1	782
10Ω	783
11	784
12	785
13	786
15	787
16	788
18	789
20	790
22	791
24	792
27	793
30	794
33	795

Value	Parts No. −□□□−
36Ω	796
39	797
43	798
47	799
51	800
56	801
62	802
68	803
75	804
82	805
91	806
100Ω	807
110	808
120	809
130	810
150	811
160	812
180	813
200	814
220	815
240	816
270	817
300	818
330	819
360	820
390	821
430	822
470	823
510	824
560	825
620	826
680	827
750	828
820	829
910	830
1kΩ	831
1.1	832

Value	Parts No. −□□□−
1.2kΩ	833
1.3	834
1.5	835
1.6	836
1.8	837
2	838
2.2	839
2.4	840
2.7	841
3	842
3.3	843
3.6	844
3.9	845
4.3	846
4.7	847
5.1	848
5.6	849
6.2	850
6.8	851
7.5	852
8.2	853
9.1	854
10kΩ	855
11	856
12	857
13	858
15	859
16	860
18	861
20	862
22	863
24	864
27	865
30	866
33	867
36	868
39	869

Value	Parts No. −□□□−
43kΩ	870
47	871
51	872
56	873
62	874
68	875
75	876
82	877
91	878
100kΩ	879
110	880
120	881
130	882
150	883
160	884
180	885
200	886
220	887
240	888
270	889
300	890
330	891
360	892
390	893
430	894
470	895
510	896
560	897
620	898
680	899
750	900
820	901
910	902
1MΩ	903

AC-41/41A, AC-42/42A

Ref. No.	Parts No.	Description
AC-41 BOARD (NTSC)		
AC-41A BOARD (PAL, PAL-M)		
	1-610-330-11	PRINTED CIRCUIT BOARD "AC-41"
	1-610-330-21	PRINTED CIRCUIT BOARD "AC-41A"
	1-535-173-00	**TERMINAL, INSERT (PC BOARD)**
	1-517-072-00	**HOLDER (NTSC)**
	1-535-131-00	**HOLDER (PAL,PAL-M)**
⚠C1	**1-108-745-00**	**MYLAR 0.22 20% 125V (NTSC)**
⚠C1	**1-130-160-00**	**MYLAR 0.22 20% 250V (PAL, PAL-M)**
⚠F1	**1-532-298-XX**	**2A (U/C)**
⚠F1	**1-532-203-00**	**TIME-LAG 2A (PAL, PAL-M)**
⚠F2	**1-532-348-00**	**2.5A (U/C)**
⚠F2	**1-532-286-00**	**TIME-LAG 2.5A (PAL, PAL-M)**

Ref. No.	Parts No.	Description
AC-42 BOARD (NTSC)		
AC-42A BOARD (PAL, PAL-M)		
	1-610-324-11	PRINTED CIRCUIT BOARD "AC-42"
	1-610-324-21	PRINTED CIRCUIT BOARD "AC-42"
	1-535-173-00	**TERMINAL, INSERT (PC BOARD)**
	1-517-072-00	**HOLDER, FUSE (NTSC)**
	1-533-131-00	**HOLDER, FUSE (PAL, PAL-M)**
C1	**1-108-389-00**	**MYLAR 0.1 10% 100V**
C2	**1-108-389-00**	**MYLAR 0.1 10% 100V**
C3	**1-108-389-00**	**MYLAR 0.1 10% 100V**
C4	**1-108-389-00**	**MYLAR 0.1 10% 100V**
C5	**1-108-389-00**	**MYLAR 0.1 10% 100V**
C6	**1-125-275-00**	**ELECT (BLOCK) 10000 99% 35V**
D1	**8-719-801-51**	**S5151R**
D2	**8-719-851-51**	**S5151**
⚠F1	**1-532-399-XX**	**3.15A (U/C)**
⚠F1	**1-532-237-00**	**TIME-LAG 3.15A (PAL, PAL-M)**

NOTE:

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Ref. No.	Parts No.	Description
CP-55 BOARD		
	A-7511-970-A	MOUNTED CIRCUIT BOARD "CP-55"
C2	1-107-209-00	MICA 20PF 5% 500V
C3	1-107-209-00	MICA 20PF 5% 500V
C4	1-102-116-00	CERAMIC 680PF 10% 50V
C5	1-123-617-00	ELECT 10 20% 16V
C6	1-123-821-00	ELECT 47 20% 16V
C9	1-124-419-00	ELECT 5600 20% 16V
C11	1-123-821-00	ELECT 47 20% 16V
C18	1-123-821-00	ELECT 47 20% 16V
C23	1-123-821-00	ELECT 47 20% 16V
C25	1-123-622-00	ELECT 22 20% 16V
C27	1-123-821-00	ELECT 47 20% 16V
C28	1-161-013-00	CERAMIC 0.01 10% 25V
C29	1-123-821-00	ELECT 47 20% 16V
C30	1-161-013-00	CERAMIC 0.01 10% 25V
C31	1-123-821-00	ELECT 47 20% 16V
C32	1-161-013-00	CERAMIC 0.01 10% 25V
C33	1-123-821-00	ELECT 47 20% 16V
C34	1-161-013-00	CERAMIC 0.01 10% 25V
C35	1-123-821-00	ELECT 47 20% 16V
C36	1-161-013-00	CERAMIC 0.01 10% 25V
C37	1-123-821-00	ELECT 47 20% 16V
C38	1-131-381-00	TANTALUM 47 10% 10V
D1	8-719-911-19	1SS119
D2	8-719-911-19	1SS119
D3	8-719-911-19	1SS119
D4	8-719-911-19	1SS119
D5	8-719-911-19	1SS119
D6	8-719-168-07	RD6.8EB
D9	8-719-911-19	1SS119
D10	8-719-911-19	1SS119
D12	8-719-151-07	RD5.1EB
D14	8-719-815-55	1S1555
D15	8-719-911-19	1SS119
D16	8-719-911-19	1SS119
D19	8-719-900-01	M4E1
D20	8-719-162-07	RD6.2E-B
D21	8-719-162-07	RD6.2E-B
D22	8-719-162-07	RD6.2E-B
D23	8-719-162-07	RD6.2E-B
D24	8-719-911-19	1SS119
D25	8-719-911-19	1SS119

Ref. No.	Parts No.	Description
IC1	8-759-240-50	TC4050BP: TOSHIBA
IC2	8-759-900-32	SN74LS32N: TI
IC3	8-759-758-74	μPD8748D-CRK11: NEC
IC4	8-759-240-28	TC4028BP: TOSHIBA
IC5	8-759-240-28	TC4028BP: TOSHIBA
IC6	8-759-045-08	MC14508BCP: MOTOROLA
IC7	8-759-250-20	TC5020BP: TOSHIBA
IC8	8-759-250-20	TC5020BP: TOSHIBA
IC9	8-759-240-47	TC4047BP: TOSHIBA
IC10	8-759-240-11	TC4011BP: TOSHIBA
IC11	8-759-045-08	MC14508BCP: MOTOROLA
IC12	8-759-045-08	MC14508BCP: MOTOROLA
IC13	8-759-262-15	TD62105P: TOSHIBA
IC14	8-759-135-80	μPC358C: NEC
Q1	8-729-178-54	2SC2785
Q2	8-729-178-54	2SC2785
Q3	8-729-178-54	2SC2785
Q4	8-729-177-43	2SD774
Q7	8-729-663-47	2SC1364
Q9	8-729-177-43	2SD774
Q10	8-729-178-54	2SC2785
Q11	8-729-178-54	2SC2785
Q12	8-729-177-43	2SD774
Q13	8-729-178-54	2SC2785
Q14	8-729-178-54	2SC2785
Q15	8-729-178-54	2SC2785
Q16	8-729-178-54	2SC2785
RV1	1-226-771-00	METAL 1K
RV2	1-226-701-00	METAL 220
RY1	1-515-434-00	MICRO LEAD
RY2	1-515-434-00	MICRO LEAD
RY3	1-515-434-00	MICRO LEAD
X1	1-527-812-00	6MHz

NOTE:

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CT-18, CT-41

Ref. No.	Parts No.	Description
CT-18 BOARD		
	1-606-082-00	PRINTED CIRCUIT BOARD "CT-18"
RV1	**1-226-342-00**	**CARBON 5K "BACKGROUND COLOR"**
CT-41 BOARD		
	A-7511-978-A	MOUNTED CIRCUIT BOARD "CT-41"
C1	**1-124-143-00**	**ELECT 100 20% 16V**
C3	**1-123-617-00**	**ELECT 10 20% 16V**
C4	**1-124-143-00**	**ELECT 100 20% 16V**
C5	**1-124-143-00**	**ELECT 100 20% 16V**
C6	**1-123-821-00**	**ELECT 47 20% 16V**
C7	**1-123-821-00**	**ELECT 47 20% 16V**
C9	**1-123-821-00**	**ELECT 47 20% 16V**
C11	**1-124-143-00**	**ELECT 100 20% 16V**
C12	**1-123-617-00**	**ELECT 10 20% 16V**
C13	**1-123-617-00**	**ELECT 10 20% 16V**
C14	**1-124-143-00**	**ELECT 100 20% 16V**
C15	**1-124-143-00**	**ELECT 100 20% 16V**
C16	**1-123-821-00**	**ELECT 47 20% 16V**
C17	**1-123-821-00**	**ELECT 47 20% 16V**
C19	**1-123-821-00**	**ELECT 47 20% 16V**
C21	**1-124-143-00**	**ELECT 100 20% 16V**
C22	**1-123-617-00**	**ELECT 10 20% 16V**
C23	**1-123-617-00**	**ELECT 10 20% 16V**
C24	**1-124-143-00**	**ELECT 100 20% 16V**
C25	**1-124-143-00**	**ELECT 100 20% 16V**
C26	**1-123-821-00**	**ELECT 47 20% 16V**
C27	**1-123-821-00**	**ELECT 47 20% 16V**
C29	**1-123-821-00**	**ELECT 47 20% 16V**
C32	**1-123-617-00**	**ELECT 10 20% 16V**
C33	**1-123-617-00**	**ELECT 10 20% 16V**
C34	**1-123-617-00**	**ELECT 10 20% 16V**
C35	**1-123-821-00**	**ELECT 47 20% 16V**
C37	**1-123-821-00**	**ELECT 47 20% 16V**
C39	**1-123-821-00**	**ELECT 47 20% 16V**
C40	**1-123-821-00**	**ELECT 47 20% 16V**
C43	**1-123-821-00**	**ELECT 47 20% 16V**
C44	**1-107-078-00**	**MICA 51PF 5% 50V**
C45	**1-107-202-00**	**MICA 10PF 5% 50V**
C46	**1-107-202-00**	**MICA 10PF 5% 50V**
C47	**1-107-202-00**	**MICA 10PF 5% 50V**
CV1	**1-141-084-XX**	**CERAMIC**
CV2	**1-141-084-XX**	**CERAMIC**
CV3	**1-141-084-XX**	**CERAMIC**
DL1	**1-415-320-00**	**470nS**
DL2	**1-415-261-00**	**20nS**
DL3	**1-415-315-00**	**75nS**
DL4	**1-415-320-00**	**470nS**
DL5	**1-415-261-00**	**20nS**
DL6	**1-415-315-00**	**75nS**
DL7	**1-415-320-00**	**470nS**
DL8	**1-415-261-00**	**20nS**
DL9	**1-415-315-00**	**75nS**
DL10	**1-415-317-00**	**170nS**
DL11	**1-415-318-00**	**250nS**
DL12	**1-415-321-00**	**500nS**
DL13	**1-415-316-00**	**200nS**
IC1	**8-758-140-00**	**CX814: SONY**
IC2	**8-758-140-00**	**CX814: SONY**
IC3	**8-758-140-00**	**CX814: SONY**
IC4	**8-749-939-92**	**BX3992: SONY**
IC5	**8-759-014-96**	**MC1496P: MOTOROLA**
IC6	**8-759-014-96**	**MC1496P: MOTOROLA**
Q1	**8-729-178-54**	**2SC2785**
Q2	**8-729-178-54**	**2SC2785**
Q3	**8-729-178-54**	**2SC2785**
Q4	**8-729-178-54**	**2SC2785**
Q5	**8-729-178-54**	**2SC2785**

NOTE:

1. **The shaded and ⚠-marked components are critical to safety.**
   Replace only with same components as specified.

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Ref. No.	Parts No.	Description
Q6	8-729-178-54	2SC2785
Q7	8-729-178-54	2SC2785
Q8	8-729-178-54	2SC2785
Q9	8-729-178-54	2SC2785
Q10	8-729-178-54	2SC2785
Q11	8-729-178-54	2SC2785
Q12	8-729-178-54	2SC2785
Q13	8-729-178-54	2SC2785
Q14	8-729-178-54	2SC2785
Q15	8-729-178-54	2SC2785
Q16	8-729-178-54	2SC2785
Q17	8-729-178-54	2SC2785
Q18	8-729-117-54	2SA1175
Q19	8-729-178-54	2SC2785
Q20	8-729-178-54	2SC2785
R53	1-214-581-00	METAL 10K 1% 1/8W
R54	1-214-169-00	METAL 36K 1% 1/4W
RV1	1-226-701-00	METAL 220
RV2	1-226-701-00	METAL 220
RV3	1-226-701-00	METAL 220

NOTE:

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   Replace only with same components as specified.

Ref. No.	Parts No.	Description
EF-11 BOARD		
	A-7511-965-A	ADJUSTED CIRCUIT BOARD "EF-11" (NTSC)
	A-7511-966-A	ADJUSTED CIRCUIT BOARD "EF-11" (PAL)
	A-7513-072-A	ADJUSTED CIRCUIT BOARD "EF-11" (PAL-M)
C3	1-123-622-00	ELECT 22 20% 16V
C5	1-124-143-00	ELECT 100 20% 16V
C6	1-123-617-00	ELECT 10 20% 16V
C7	1-123-617-00	ELECT 10 20% 16V
C9	1-107-076-00	MICA 43PF 5% 50V
C10	1-123-617-00	ELECT 10 20% 16V
C11	1-123-617-00	ELECT 10 20% 16V
C13	1-123-617-00	ELECT 10 20% 16V
C14	1-124-143-00	ELECT 100 20% 16V
C15	1-123-821-00	ELECT 47 20% 16V
C16	1-124-143-00	ELECT 100 20% 16V
C17	1-123-821-00	ELECT 47 20% 16V
C18	1-123-821-00	ELECT 47 20% 16V
C20	1-123-821-00	ELECT 47 20% 16V
C22	1-123-821-00	ELECT 47 20% 16V
C23	1-123-821-00	ELECT 47 20% 16V
C24	1-123-617-00	ELECT 10 20% 16V
C25	1-123-617-00	ELECT 10 20% 16V
C26	1-123-821-00	ELECT 47 20% 16V
C27	1-123-821-00	ELECT 47 20% 16V
C28	1-123-617-00	ELECT 10 20% 16V
C29	1-123-617-00	ELECT 10 20% 16V
C30	1-123-617-00	ELECT 10 20% 16V
C31	1-123-617-00	ELECT 10 20% 16V
C32	1-123-617-00	ELECT 10 20% 16V
C34	1-107-076-00	MICA 43PF 5% 50V
C35	1-123-617-00	ELECT 10 20% 16V
C36	1-123-617-00	ELECT 10 20% 16V
C37	1-107-076-00	MICA 43PF 5% 50V
C39	1-123-617-00	ELECT 10 20% 16V
C40	1-123-617-00	ELECT 10 20% 16V
C41	1-123-617-00	ELECT 10 20% 16V
C42	1-123-617-00	ELECT 10 20% 16V
C43	1-123-617-00	ELECT 10 20% 16V
C45	1-123-821-00	ELECT 47 20% 16V
C47	1-123-821-00	ELECT 47 20% 16V
C48	1-124-143-00	ELECT 100 20% 16V
C49	1-124-143-00	ELECT 100 20% 16V
C50	1-124-143-00	ELECT 100 20% 16V
C51	1-123-821-00	ELECT 47 20% 16V

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Ref. No.	Parts No.	Description
C52	1-123-821-00	ELECT 47 20% 16V
C53	1-123-617-00	ELECT 10 20% 16V
C54	1-123-617-00	ELECT 10 20% 16V
C60	1-107-085-00	MICA 100PF 5% 50V
C61	1-107-085-00	MICA 100PF 5% 50V
C67	1-107-085-00	MICA 100PF 5% 50V
C68	1-107-085-00	MICA 100PF 5% 50V
C69	1-123-821-00	ELECT 47 20% 16V
C70	1-123-617-00	ELECT 10 20% 16V
C72	1-107-076-00	MICA 43PF 5% 50V
C73	1-123-617-00	ELECT 10 20% 16V
C74	1-123-617-00	ELECT 10 20% 16V
C76	1-123-821-00	ELECT 47 20% 16V
C77	1-123-821-00	ELECT 47 20% 16V
C79	1-123-821-00	ELECT 47 20% 16V
C81	1-123-821-00	ELECT 47 20% 16V
C82	1-107-208-00	MICA 18PF 5% 500V
C84	1-123-617-00	ELECT 10 20% 16V
C85	1-123-617-00	ELECT 10 20% 16V
C87	1-123-617-00	ELECT 10 20% 16V
C88	1-123-617-00	ELECT 10 20% 16V
C90	1-123-617-00	ELECT 10 20% 16V
C91	1-123-617-00	ELECT 10 20% 16V
C92	1-123-617-00	ELECT 10 20% 16V
C93	1-123-617-00	ELECT 10 20% 16V
C94	1-123-617-00	ELECT 10 20% 16V
C95	1-123-821-00	ELECT 47 20% 16V
C96	1-107-210-00	MICA 22PF 5% 500V
C98	1-123-617-00	ELECT 10 20% 16V
C99	1-123-821-00	ELECT 47 20% 16V
C101	1-123-821-00	ELECT 47 20% 16V
C103	1-123-821-00	ELECT 47 20% 16V
C104	1-107-208-00	MICA 18PF 5% 500V
C106	1-123-821-00	ELECT 47 20% 16V
C107	1-107-208-00	MICA 18PF 5% 500V
C108	1-123-617-00	ELECT 10 20% 16V
C110	1-123-617-00	ELECT 10 20% 16V
C111	1-123-821-00	ELECT 47 20% 16V
C112	1-123-617-00	ELECT 10 20% 16V
C113	1-123-617-00	ELECT 10 20% 16V
C114	1-123-617-00	ELECT 10 20% 16V
C116	1-123-821-00	ELECT 47 20% 16V
C118	1-123-617-00	ELECT 10 20% 16V
C119	1-123-617-00	ELECT 10 20% 16V
C121	1-123-821-00	ELECT 47 20% 16V

Ref. No.	Parts No.	Description
C123	1-123-821-00	ELECT 47 20% 16V
C124	1-123-607-00	ELECT 0.1 20% 50V
C125	1-123-617-00	ELECT 10 20% 16V
C126	1-123-617-00	ELECT 10 20% 16V
C128	1-123-617-00	ELECT 10 20% 16V
C129	1-123-617-00	ELECT 10 20% 16V
C130	1-123-821-00	ELECT 47 20% 16V
C132	1-123-622-00	ELECT 22 20% 16V
C133	1-107-159-00	MICA 33PF 5% 500V
C134	1-107-081-00	MICA 68PF 5% 500V
C136	1-107-078-00	MICA 51PF 5% 50V
C138	1-107-210-00	MICA 22PF 5% 500V
C301	1-161-057-00	CERAMIC 0.033 10% 25V
C302	1-102-112-00	CERAMIC 330PF 10% 50V
C303	1-107-159-00	MICA 33PF 5% 500V
CV1	1-141-084-XX	CERAMIC 55PF
CV2	1-141-084-XX	CERAMIC 55PF
CV4	1-141-084-XX	CERAMIC 55PF
D1	8-719-151-07	RD5.1EB
D2	8-719-911-19	1SS119
D3	8-719-100-12	RD2.7EB
D4	8-719-911-19	1SS119
D5	8-719-911-19	1SS119
D6	8-719-139-07	RD3.9EB
	(Serial No. 10021 and higher) (NTSC)	
	(Serial No. 10001 and higher) (PAL, PAL-M)	
D7	8-719-911-19	1SS119
	(Serial No. 10021 and higher) (NTSC)	
	(Serial No. 10001 and higher) (PAL, PAL-M)	
DL1	1-415-369-11	500nS
DL2	1-415-369-11	500nS
DL3	1-415-319-00	400nS
FL1	1-235-161-00	3.58MHz (NTSC, PAL-M)
FL1	1-235-181-00	4.43MHz BAND PASS (PAL)
FL2	1-235-246-00	3.58MHz (NTSC, PAL-M)
FL2	1-235-245-00	TRAP 4.43MHz (PAL)
FL3	1-235-246-00	3.58MHz (NTSC, PAL-M)
FL3	1-235-245-00	TRAP 4.43MHz (PAL)
IC1	8-759-135-80	μPC358C: NEC
IC2	8-759-135-80	μPC358C: NEC
IC3	8-759-930-54	CA3054: RCA
IC4	8-749-939-92	BX3992: SONY
IC5	8-758-140-00	CX814: SONY

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Ref. No.	Parts No.	Description
IC6	8-758-140-00	CX814: SONY
IC7	8-749-939-89	BX3989: SONY
IC8	8-759-930-54	CA3054: RCA
IC9	8-749-939-92	BX3992: SONY
IC10	8-759-930-54	CA3054: RCA
IC11	8-749-939-89	BX3989: SONY
IC12	8-759-969-13	SN16913P: TI
IC13	8-759-969-13	SN16913P: TI
IC14	8-749-939-92	BX3992: SONY
IC16	8-749-939-92	BX3992: SONY
IC17	8-759-014-96	MC1496P: MOTOROLA
IC18	8-759-014-96	MC1496P: MOTOROLA
IC19	8-749-939-90	BX3990: SONY
IC20	8-749-939-90	BX3990: SONY
IC21	8-759-909-77	μA711CN: TI
IC22	8-749-939-92	BX3992: SONY
L1	1-407-165-XX	MICRO 47 (NTSC, PAL-M)
L1	1-407-161-XX	MICRO 22 (PAL)
L2	1-407-165-XX	MICRO 47 (NTSC, PAL-M)
L2	1-407-161-XX	MICRO 22 (PAL)
L3	1-407-165-XX	MICRO 47 (NTSC, PAL-M)
L3	1-407-161-XX	MICRO 22 (PAL)
L4	1-407-165-XX	MICRO 47 (NTSC, PAL-M)
L4	1-407-161-XX	MICRO 22 (PAL)
L5	1-407-173-XX	MICRO 220
L6	1-407-157-XX	MICRO 10
L7	1-407-173-XX	MICRO 220
L8	1-407-157-XX	MICRO 10
Q1	8-729-663-47	2SC1364
Q2	8-729-663-47	2SC1364
Q3	8-729-117-54	2SA1175
Q4	8-729-117-54	2SA1175
Q5	8-729-117-54	2SA1175
Q6	8-729-117-54	2SA1175
Q7	8-729-117-54	2SA1175
Q8	8-729-178-54	2SC2785
Q9	8-729-178-54	2SC2785
Q10	8-729-117-54	2SA1175
Q11	8-729-178-54	2SC2785
Q12	8-729-178-54	2SC2785
Q13	8-729-178-54	2SC2785
Q14	8-729-178-54	2SC2785
Q15	8-729-178-54	2SC2785
Q16	8-729-178-54	2SC2785
Q17	8-729-178-54	2SC2785
Q18	8-729-117-54	2SA1175
Q19	8-729-117-54	2SA1175
Q20	8-729-178-54	2SC2785
Q21	8-729-178-54	2SC2785
Q22	8-729-178-54	2SC2785
Q23	8-729-117-54	2SA1175
Q24	8-729-178-54	2SC2785
Q25	8-729-117-54	2SA1175
Q26	8-729-117-54	2SA1175
Q27	8-729-117-54	2SA1175
Q28	8-729-178-54	2SC2785
Q29	8-729-178-54	2SC2785
Q30	8-729-178-54	2SC2785
Q31	8-729-178-54	2SC2785
Q32	8-729-178-54	2SC2785
Q33	8-729-178-54	2SC2785
Q34	8-729-178-54	2SC2785
Q35	8-729-117-54	2SA1175
Q36	8-729-178-54	2SC2785
Q37	8-729-178-54	2SC2785
Q38	8-729-178-54	2SC2785
Q39	8-729-178-54	2SC2785
Q40	8-729-178-54	2SC2785
Q41	8-729-117-54	2SA1175
Q42	8-729-178-54	2SC2785
Q43	8-729-178-54	2SC2785
Q44	8-729-178-54	2SC2785
Q45	8-729-178-54	2SC2785
Q46	8-729-178-54	2SC2785
Q47	8-729-178-54	2SC2785
Q48	8-729-178-54	2SC2785
Q49	8-729-178-54	2SC2785
Q50	8-729-117-54	2SA1175
Q51	8-729-117-54	2SA1175
Q52	8-729-178-54	2SC2785
Q53	8-729-178-54	2SC2785
Q55	8-729-178-54	2SC2785
Q56	8-729-178-54	2SC2785
Q57	8-729-117-54	2SA1175
Q58	8-729-178-54	2SC2785
Q60	8-729-117-54	2SA1175
Q61	8-729-117-54	2SA1175
Q62	8-729-178-54	2SC2785

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Ref. No.	Parts No.	Description
Q63	8-729-178-54	2SC2785
Q64	8-729-178-54	2SC2785
Q65	8-729-117-54	2SA1175
Q66	8-729-178-54	2SC2785
Q67	8-729-178-54	2SC2785
Q68	8-729-178-54	2SC2785
Q69	8-729-178-54	2SC2785
Q70	8-729-178-54	2SC2785
Q71	8-729-178-54	2SC2785
Q72	8-729-178-54	2SC2785
Q73	8-729-178-54	2SC2785
Q74	8-729-178-54	2SC2785
Q75	8-729-178-54	2SC2785
Q76	8-729-178-54	2SC2785
Q77	8-729-178-54	2SC2785
Q78	8-729-178-54	2SC2785
Q79	8-729-178-54	2SC2785
Q80	8-729-117-54	2SA1175
Q81	8-729-178-54	2SC2785
Q82	8-729-117-54	2SA1175
Q83	8-729-117-54	2SA1175
Q84	8-729-117-54	2SA1175
Q85	8-729-178-54	2SC2785
Q86	8-729-178-54	2SC2785
Q87	8-729-178-54	2SC2785
Q88	8-729-117-54	2SA1175
Q89	8-729-117-54	2SA1175
Q90	8-729-178-54	2SC2785
Q91	8-729-178-54	2SC2785
Q92	8-729-178-54	2SC2785
Q93	8-729-178-54	2SC2785
Q94	8-729-178-54	2SC2785
Q95	8-729-178-54	2SC2785
Q96	8-729-117-54	2SA1175
Q97	8-729-117-54	2SA1175
Q98	8-729-117-54	2SA1175
Q99	8-729-117-54	2SA1175
Q100	8-729-178-54	2SC2785
Q101	8-729-178-54	2SC2785
Q102	8-729-117-54	2SA1175
Q103	8-729-117-54	2SA1175
Q104	8-729-178-54	2SC2785
Q105	8-729-178-54	2SC2785
Q107	8-729-178-54	2SC2785
Q108	8-729-178-54	2SC2785

Ref. No.	Parts No.	Description
Q109	8-729-178-54	2SC2785
Q110	8-729-178-54	2SC2785
Q111	8-729-178-54	2SC2785
Q112	8-729-117-54	2SA1175
Q113	8-729-117-54	2SA1175
Q114	8-729-178-54	2SC2785
R141	1-214-549-00	METAL 470 1% 1/8W
R142	1-214-549-00	METAL 470 1% 1/8W
R143	1-214-565-00	METAL 2.2K 1% 1/8W
R150	1-214-503-00	METAL 3.32K 0.5% 1/4W
R151	1-214-561-00	METAL 1.5K 1% 1/8W
R152	1-214-557-00	METAL 1K 1% 1/8W
R159	1-214-571-00	METAL 3.9K 1% 1/8W
R160	1-214-571-00	METAL 3.9K 1% 1/8W
R162	1-214-561-00	METAL 1.5K 1% 1/8W
R163	1-214-565-00	METAL 2.2K 1% 1/8W
R180	1-214-169-00	METAL 36K 1% 1/4W
R181	1-214-581-00	METAL 10K 1% 1/8W
R202	1-214-549-00	METAL 470 1% 1/8W
R203	1-214-549-00	METAL 470 1% 1/8W
R204	1-214-565-00	METAL 2.2K 1% 1/8W
R210	1-214-499-00	METAL 1.62K 0.5% 1/4W
R213	1-214-549-00	METAL 470 1% 1/8W
R214	1-214-549-00	METAL 470 1% 1/8W
R215	1-214-565-00	METAL 2.2K 1% 1/8W
R221	1-214-504-00	METAL 9.09K 0.5% 1/4W
R222	1-214-571-00	METAL 3.9K 1% 1/8W
R223	1-214-571-00	METAL 3.9K 1% 1/8W
R224	1-214-561-00	METAL 1.5K 1% 1/8W
R225	1-214-565-00	METAL 2.2K 1% 1/8W
RV1	1-226-771-00	METAL 1K
RV2	1-226-771-00	METAL 1K
RV3	1-226-703-00	METAL 10K
RV4	1-226-702-00	METAL 2.2K
RV5	1-226-771-00	METAL 1K
RV6	1-226-703-00	METAL 10K
RV7	1-226-771-00	METAL 1K
RV8	1-226-772-00	METAL 4.7K
RV9	1-226-772-00	METAL 4.7K
RV10	1-226-771-00	METAL 1K
RV11	1-226-771-00	METAL 1K
RV12	1-226-772-00	METAL 4.7K
RV13	1-226-703-00	METAL 10K
RV14	1-226-702-00	METAL 2.2K
RV15	1-226-702-00	METAL 2.2K

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Ref. No.	Parts No.	Description
RV16	1-226-702-00	METAL 2.2K
RV17	1-226-703-00	METAL 10K
RV18	1-226-702-00	METAL 2.2K
RV19	1-226-772-00	METAL 4.7K

EF-12 BOARD

	A-7615-124-A	ADJUSTED CIRCUIT BOARD "EF-12" (NTSC)
	A-7615-125-A	ADJUSTED CIRCUIT BOARD "EF-12" (PAL)
	A-7615-126-A	ADJUSTED CIRCUIT BOARD "EF-12" (PAL-M)
C1	1-123-821-00	ELECT 47 20% 16V
C2	1-123-821-00	ELECT 47 20% 16V
C3	1-123-821-00	ELECT 47 20% 16V
C4	1-123-821-00	ELECT 47 20% 16V (PAL, PAL-M)
C5	1-123-821-00	ELECT 47 20% 16V
C6	1-123-821-00	ELECT 47 20% 16V
C7	1-107-085-00	MICA 100PF 5% 50V
C8	1-107-085-00	MICA 100PF 5% 50V
C9	1-107-085-00	MICA 100PF 5% 50V
C10	1-107-085-00	MICA 100PF 5% 50V
C11	1-107-085-00	MICA 100PF 5% 50V
C12	1-123-617-00	ELECT 10 20% 16V
C13	1-107-210-00	MICA 22PF 5% 500V
C14	1-123-821-00	ELECT 47 20% 16V
C15	1-123-617-00	ELECT 10 20% 16V
C16	1-107-077-00	MICA 47PF 5% 50V
C17	1-107-093-00	MICA 220PF 5% 50V
C18	1-124-143-00	ELECT 100 20% 16V
C19	1-123-821-00	ELECT 47 20% 16V
C20	1-123-611-00	ELECT 1 20% 50V
C21	1-123-821-00	ELECT 47 20% 16V
C22	1-102-106-00	CERAMIC 100PF 10% 50V
C23	1-123-617-00	ELECT 10 20% 16V
C25	1-123-622-00	ELECT 22 20% 16V
C26	1-123-622-00	ELECT 22 20% 16V

Ref. No.	Parts No.	Description
C27	1-107-085-00	MICA 100PF 5% 50V
C28	1-107-210-00	MICA 22PF 5% 500V
C29	1-107-210-00	MICA 22PF 5% 500V
C36	1-161-013-00	CERAMIC 0.01 10% 25V
C37	1-161-013-00	CERAMIC 0.01 10% 25V
C38	1-161-013-00	CERAMIC 0.01 10% 25V
C40	1-102-106-00	CERAMIC 100PF 10% 50V
C41	1-102-106-00	CERAMIC 100PF 10% 50V
C42	1-123-617-00	ELECT 10 20% 16V
C43	1-123-617-00	ELECT 10 20% 16V
C46	1-107-082-00	MICA 75PF 5% 50V
C48	1-107-210-00	MICA 22PF 5% 500V
C49	1-107-210-00	MICA 22PF 5% 500V
C55	1-123-821-00	ELECT 47 20% 16V
C56	1-123-821-00	ELECT 47 20% 16V
C57	1-123-821-00	ELECT 47 20% 16V (PAL, PAL-M)
C60	1-107-207-00	MICA 16PF 5% 500V
C61	1-107-159-00	MICA 33PF 5% 500V (NTSC, PAL-M)
C61	1-107-210-00	MICA 22PF 5% 500V (PAL)
C62	1-107-159-00	MICA 33PF 5% 500V (NTSC, PAL-M)
C62	1-107-210-00	MICA 22PF 5% 500V (PAL)
C63	1-107-159-00	MICA 33PF 5% 500V (NTSC, PAL-M)
C63	1-107-210-00	MICA 22PF 5% 500V (PAL)
C64	1-107-159-00	MICA 33PF 5% 500V (NTSC, PAL-M)
C64	1-107-210-00	MICA 22PF 5% 500V (PAL)
C65	1-123-617-00	ELECT 10 20% 16V
C66	1-123-617-00	ELECT 10 20% 16V
C67	1-123-617-00	ELECT 10 20% 16V
C68	1-123-821-00	ELECT 47 20% 16V
C69	1-107-079-00	MICA 56PF 5% 50V (NTSC, PAL-M)
C69	1-107-085-00	MICA 100PF 5% 50V (PAL)
C70	1-124-143-00	ELECT 100 20% 16V
C71	1-123-617-00	ELECT 10 20% 16V
C72	1-123-617-00	ELECT 10 20% 16V
C73	1-123-617-00	ELECT 10 20% 16V
C74	1-123-821-00	ELECT 47 20% 16V
C75	1-123-617-00	ELECT 10 20% 16V
C76	1-161-013-00	CERAMIC 0.01 10% 25V
C77	1-161-013-00	CERAMIC 0.01 10% 25V
C78	1-123-617-00	ELECT 10 20% 16V
C79	1-102-106-00	CERAMIC 100PF 10% 50V
C80	1-124-143-00	ELECT 100 20% 16V
C81	1-123-622-00	ELECT 22 20% 16V
C82	1-123-622-00	ELECT 22 20% 16V
C84	1-123-617-00	ELECT 10 20% 16V

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Ref. No.	Parts No.	Description
C86	1-123-617-00	ELECT 10 20% 16V
C87	1-123-617-00	ELECT 10 20% 16V
C88	1-123-821-00	ELECT 47 20% 16V
C90	1-123-821-00	ELECT 47 20% 16V
C92	1-123-821-00	ELECT 47 20% 16V
C94	1-123-821-00	ELECT 47 20% 16V
C95	1-123-821-00	ELECT 47 20% 16V
C96	1-123-821-00	ELECT 47 20% 16V
C97	1-123-617-00	ELECT 10 20% 16V
C98	1-123-821-00	ELECT 47 20% 16V
C100	1-123-821-00	ELECT 47 20% 16V
C101	1-123-821-00	ELECT 47 20% 16V (PAL, PAL-M)
C102	1-123-821-00	ELECT 47 20% 16V
C104	1-123-617-00	ELECT 10 20% 16V
C106	1-107-075-00	MICA 39PF 5% 500V
C107	1-123-821-00	ELECT 47 20% 16V
C108	1-107-083-00	MICA 82PF 5% 50V
C109	1-107-157-00	MICA 27PF 5% 500V (NTSC, PAL-M)
C109	1-107-208-00	MICA 18PF 5% 500V (PAL)
C111	1-102-110-00	CERAMIC 220PF 10% 50V
C113	1-123-617-00	ELECT 10 20% 16V
C114	1-123-617-00	ELECT 10 20% 16V
C115	1-123-821-00	ELECT 47 20% 16V
C121	1-123-821-00	ELECT 47 20% 16V
C122	1-107-159-00	MICA 33PF 5% 500V
C123	1-107-210-00	MICA 22PF 5% 500V
C124	1-107-210-00	MICA 22PF 5% 500V
C128	1-123-821-00	ELECT 47 20% 16V
C129	1-124-144-00	ELECT 220 20% 16V
C301	1-107-209-00	MICA 20PF 5% 500V
C302	1-102-106-00	CERAMIC 100PF 10% 50V (Serial No. 10021 and higher) (NTSC) (Serial No. 10001 and higher) (PAL-M)
C302	1-102-108-00	CERAMIC 150PF 10% 50V (Serial No. 10001 and higher) (PAL)
CV1	1-141-084-XX	CERAMIC 55PF
D3	8-719-151-07	RD5.1EB
D4	8-719-911-19	1SS119
D5	8-719-911-19	1SS119
D6	8-719-911-19	1SS119
D7	8-719-911-19	1SS119
D8	8-719-911-19	1SS119
D9	8-719-911-19	1SS119
D10	8-719-911-19	1SS119
D11	8-719-911-19	1SS119
D12	8-719-911-19	1SS119

Ref. No.	Parts No.	Description
D13	8-719-911-19	1SS119
D14	8-719-911-19	1SS119
D15	8-719-911-19	1SS119
D16	8-719-911-19	1SS119
D17	8-719-911-19	1SS119
D18	8-719-139-07	RD3.9EB (Serial No. 10021 and higher) (NTSC) (Serial No. 10001 and higher) (PAL, PAL-M)
D19	8-719-911-19	1SS119 (Serial No. 10021 and higher) (NTSC) (Serial No. 10001 and higher) (PAL, PAL-M)
FL1	1-235-161-00	BAND PASS 3.58MHz (NTSC, PAL-M)
FL1	1-235-181-00	BAND PASS 4.43MHz (PAL)
IC1	8-759-900-26	SN74LS26N: TI
IC2	8-759-900-26	SN74LS26N: TI
IC3	8-759-240-11	TC4011BP: TOSHIBA
IC4	8-759-240-49	TC4049BP: TOSHIBA
IC5	8-759-240-69	TC4069UBP: TOSHIBA
IC6	8-759-245-28	TC4528BP: TOSHIBA
IC7	8-759-901-07	SN74LS107AN: TI
IC8	8-759-245-28	TC4528BP: TOSHIBA
IC9	8-759-245-28	TC4528BP: TOSHIBA
IC10	8-759-135-80	μPC358C: NEC
IC11	8-759-133-90	μPC339C: NEC
IC12	8-759-133-90	μPC339C: NEC
IC13	8-759-240-53	TC4053BP: TOSHIBA
IC14	8-759-240-28	TC4028BP: TOSHIBA
IC15	8-759-240-42	TC4042BP: TOSHIBA
IC16	8-759-969-13	SN16913P: TI
IC17	8-752-001-70	CX22017: SONY
IC18	8-759-930-54	CA3054: FSC
IC19	8-759-930-54	CA3054: FSC
IC20	8-759-930-54	CA3054: FSC
L1	1-407-573-00	COIL 47
L2	1-407-574-00	COIL 68 (NTSC, PAL-M)
L2	1-407-573-00	COIL 47 (PAL)
L3	1-407-574-00	COIL 68 (NTSC, PAL-M)
L3	1-407-573-00	COIL 47 (PAL)
L4	1-407-161-XX	MICRO 22
L5	1-407-161-XX	MICRO 22
L6	1-407-170-00	MICRO 120 (NTSC, PAL-M)
L6	1-407-173-XX	MICRO 220 (PAL)
L7	1-407-162-XX	MICRO 27 (NTSC, PAL-M)
L7	1-407-160-XX	MICRO 18 (PAL)
L8	1-407-168-XX	MICRO 82
L9	1-407-169-XX	MICRO 100
L10	1-407-573-00	COIL 47

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Ref. No.	Parts No.	Description
Q1	8-729-178-54	2SC2785
Q2	8-729-117-54	2SA1175
Q3	8-729-178-54	2SC2785
Q4	8-729-178-54	2SC2785
Q5	8-729-117-54	2SA1175
Q6	8-729-178-54	2SC2785
Q7	8-729-117-54	2SA1175
Q8	8-729-178-54	2SC2785
Q9	8-729-178-54	2SC2785
Q10	8-729-117-54	2SA1175
Q11	8-729-117-54	2SA1175
Q12	8-729-178-54	2SC2785
Q13	8-729-178-54	2SC2785
Q14	8-729-178-54	2SC2785
Q15	8-729-117-54	2SA1175
Q16	8-729-178-54	2SC2785
Q17	8-729-178-54	2SC2785
Q18	8-729-178-54	2SC2785
Q19	8-729-178-54	2SC2785
Q20	8-729-178-54	2SC2785
Q21	8-729-178-54	2SC2785
Q22	8-729-178-54	2SC2785
Q23	8-729-178-54	2SC2785
Q24	8-729-178-54	2SC2785
Q25	8-729-178-54	2SC2785
Q26	8-729-117-54	2SA1175
Q27	8-729-117-54	2SA1175
Q28	8-729-117-54	2SA1175
Q29	8-729-117-54	2SA1175
Q30	8-729-117-54	2SA1175
Q32	8-729-663-47	2SC1364
Q34	8-729-117-54	2SA1175
Q35	8-729-117-54	2SA1175
Q36	8-729-178-54	2SC2785
Q37	8-729-178-54	2SC2785
Q38	8-729-178-54	2SC2785
Q39	8-729-178-54	2SC2785
Q40	8-729-178-54	2SC2785
Q41	8-729-178-54	2SC2785
Q42	8-729-178-54	2SC2785
Q43	8-729-178-54	2SC2785
Q44	8-729-178-54	2SC2785
Q45	8-729-178-54	2SC2785
Q46	8-729-178-54	2SC2785
Q47	8-729-178-54	2SC2785

Ref. No.	Parts No.	Description
Q48	8-729-178-54	2SC2785
Q49	8-729-117-54	2SA1175
Q50	8-729-178-54	2SC2785
Q51	8-729-178-54	2SC2785
Q52	8-729-178-54	2SC2785
Q53	8-729-178-54	2SC2785
Q54	8-729-178-54	2SC2785
Q55	8-729-178-54	2SC2785
Q56	8-729-178-54	2SC2785
Q57	8-729-178-54	2SC2785
Q58	8-729-178-54	2SC2785
Q59	8-729-117-54	2SA1175
Q60	8-729-117-54	2SA1175
Q61	8-729-117-54	2SA1175
Q62	8-729-178-54	2SC2785
Q63	8-729-117-54	2SA1175
Q64	8-729-117-54	2SA1175
Q65	8-729-178-54	2SC2785
Q66	8-729-178-54	2SC2785
Q67	8-729-178-54	2SC2785
Q68	8-729-178-54	2SC2785
Q69	8-729-178-54	2SC2785
Q70	8-729-178-54	2SC2785
Q71	8-729-178-54	2SC2785
Q72	8-729-178-54	2SC2785
Q73	8-729-178-54	2SC2785
Q74	8-729-178-54	2SC2785
Q75	8-729-178-54	2SC2785
Q76	8-729-177-43	2SD774
Q77	8-729-178-54	2SC2785
Q78	8-729-178-54	2SC2785
Q79	8-729-178-54	2SC2785
Q80	8-729-178-54	2SC2785
Q81	8-729-178-54	2SC2785
Q82	8-729-117-54	2SA1175
Q83	8-729-117-54	2SA1175
Q84	8-729-178-54	2SC2785
Q85	8-729-697-92	2SA979
Q86	8-729-178-54	2SC2785
Q87	8-723-302-00	2SK43-2
Q88	8-729-117-54	2SA1175
Q89	8-729-117-54	2SA1175
Q90	8-729-117-54	2SA1175
Q91	8-729-178-54	2SC2785
Q92	8-729-178-54	2SC2785

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Ref. No.	Parts No.	Description
Q93	8-729-178-54	2SC2785
Q94	8-729-178-54	2SC2785
Q95	8-729-178-54	2SC2785
Q96	8-729-178-54	2SC2785
R38	1-247-115-00	CARBON 220 5% 1/4W
	(Serial No. 10161 and higher) (U/C)	
	(Serial No. 10111 and higher) (AEP)	
	(Serial No. 10011 and higher) (UK)	
	(Serial No. 10011 and higher) (BRZ)	
R82	1-214-548-00	METAL 430 1% 1/8W
R83	1-214-548-00	METAL 430 1% 1/8W
R84	1-214-548-00	METAL 430 1% 1/8W
R85	1-214-548-00	METAL 430 1% 1/8W
R86	1-214-576-00	METAL 6.2K 1% 1/8W
R87	1-214-576-00	METAL 6.2K 1% 1/8W
RV1	1-226-773-00	METAL 22K
RV2	1-226-703-00	METAL 10K
RV3	1-226-702-00	METAL 2.2K
RV4	1-226-774-00	METAL 47K
RV5	1-226-772-00	METAL 4.7K
RV6	1-226-702-00	METAL 2.2K
RV7	1-226-773-00	METAL 22K
RV8	1-226-703-00	METAL 10K
RV9	1-226-703-00	METAL 10K
RV10	1-226-773-00	METAL 22K
RV11	1-226-702-00	METAL 2.2K
RV12	1-226-702-00	METAL 2.2K
RV13	1-226-771-00	METAL 1K
RV14	1-226-772-00	METAL 4.7K
RV15	1-226-702-00	METAL 2.2K
RV18	1-226-771-00	METAL 1K
RV19	1-226-771-00	METAL 1K
RV20	1-226-772-00	METAL 4.7K
RV21	1-226-770-00	METAL 470
RV22	1-226-702-00	METAL 2.2K
RV23	1-226-772-00	METAL 4.7K
RV24	1-226-701-00	METAL 220
RV25	1-226-701-00	METAL 220
RV26	1-226-771-00	METAL 1K
RV27	1-226-771-00	METAL 1K
RV28	1-226-771-00	METAL 1K
RV29	1-226-773-00	METAL 22K
RV30	1-226-773-00	METAL 22K
TH1	1-800-071-XX	DIRECT-HEATING DISK 300Ω
TH2	1-800-071-XX	DIRECT-HEATING DISK 300Ω
TH3	1-800-071-XX	DIRECT-HEATING DISK 300Ω

Ref. No.	Parts No.	Description
KY-35 BOARD		
	A-7511-977-A	MOUNTED CIRCUIT BOARD "KY-35"
D1	8-719-815-55	1S1555
D2	8-719-815-55	1S1555
D3	8-719-815-55	1S1555
D4	8-719-815-55	1S1555
D5	8-719-815-55	1S1555
D6	8-719-815-55	1S1555
D7	8-719-815-55	1S1555
D8	8-719-815-55	1S1555
D9	8-719-815-55	1S1555
D10	8-719-815-55	1S1555
D11	8-719-815-55	1S1555
D12	8-719-815-55	1S1555
IC1	8-759-262-15	TD62105P: TOSHIBA
RV1	1-230-137-00	CARBON 5K
RV2	1-230-137-00	CARBON 5K
RV3	1-230-138-00	CARBON 5K
RV4	1-230-139-00	CARBON 10K
RV5	1-230-136-00	CARBON 5K/5K
RV6	1-230-139-00	CARBON 10K
RV7	1-230-137-00	CARBON 5K
RV8	1-230-137-00	CARBON 5K
S1	1-553-550-41	PUSH
S2	1-553-550-41	PUSH
S3	1-553-550-41	PUSH
S4	1-553-550-41	PUSH
S5	1-553-550-41	PUSH
S6	1-553-550-41	PUSH
S7	1-553-550-41	PUSH
S8	1-516-961-00	LEVER SLIDE
S9	1-516-961-00	LEVER SLIDE
S10	1-516-995-00	LEVER SLIDE
S11	1-516-961-00	LEVER SLIDE

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Ref. No.	Parts No.	Description
SG-34 BOARD (PAL, PAL-M)		
	A-7511-520-A	MOUNTED CIRCUIT BOARD "SG-34" (PAL)
	A-7511-652-A	MOUNTED CIRCUIT BOARD "SG-34" (PAL-M)
C1	1-161-013-00	CERAMIC 0.01 10% 25V
C2	1-161-013-00	CERAMIC 0.01 10% 25V
C3	1-131-377-00	TANTALUM 10 10% 10V
C4	1-107-075-00	MICA 39PF 5% 50V (PAL)
C4	1-107-079-00	MICA 56PF 5% 50V (PAL-M)
C5	1-131-344-00	TANTALUM 0.33 10% 35V
C6	1-131-341-00	TANTALUM 0.1 10% 35V
C7	1-107-075-00	MICA 39PF 5% 50V
C8	1-131-341-00	TANTALUM 0.1 10% 35V
C9	1-161-013-00	CERAMIC 0.01 01% 25V
C10	1-131-380-00	TANTALUM 33 10% 10V
C11	1-131-374-00	TANTALUM 33 10% 16V
C12	1-131-374-00	TANTALUM 33 10% 16V
C13	1-107-208-00	MICA 18PF 5% 500V
C14	1-161-013-00	CERAMIC 0.01 10% 25V
C15	1-131-377-00	TANTALUM 10 10% 10V
C17	1-161-013-00	CERAMIC 0.01 10% 25V
C18	1-131-377-00	TANTALUM 10 10% 10V
C19	1-108-227-00	MYLAR 0.001 10% 50V
C20	1-131-377-00	TANTALUM 10 10% 10V
C21	1-131-380-00	TANTALUM 33 10% 10V
C23	1-131-347-00	TANTALUM 1 10% 35V
C25	1-161-013-00	CERAMIC 0.01 10% 25V
C26	1-161-013-00	CERAMIC 0.01 10% 25V
C27	1-131-380-00	TANTALUM 33 10% 10V
C28	1-161-013-00	CERAMIC 0.01 10% 25V
C29	1-131-381-00	TANTALUM 47 10% 10V
C30	1-131-369-00	TANTALUM 4.7 10% 16V
C31	1-131-380-00	TANTALUM 33 10% 10V
C32	1-107-077-00	MICA 47PF 5% 50V
C33	1-161-013-00	CERAMIC 0.01 10% 25V
C34	1-161-039-00	CERAMIC 0.001 10% 25V
C35	1-107-208-00	MICA 18PF 5% 500V (PAL)
C35	1-107-077-00	MICA 47PF 5% 50V (PAL-M)
C36	1-161-013-00	CERAMIC 0.01 10% 25V
C37	1-131-341-00	TANTALUM 0.1 10% 35V
C38	1-131-370-00	TANTALUM 6.8 10% 16V
C39	1-131-377-00	TANTALUM 10 10% 10V
C40	1-161-013-00	CERAMIC 0.01 10% 25V
C41	1-107-208-00	MICA 18PF 5% 500V

Ref. No.	Parts No.	Description
C42	1-161-013-00	CERAMIC 0.01 10% 25V
C43	1-131-341-00	TANTALUM 0.1 10% 35V
C44	1-131-370-00	TANTALUM 6.8 10% 16V
C45	1-102-363-00	CERAMIC 0.001 50V
C46	1-102-242-00	CERAMIC 3PF ±0.5PF 50V
C47	1-102-363-00	CERAMIC 0.001 50V
C48	1-102-246-00	CERAMIC 47PF 10% 150V
C49	1-102-246-00	CERAMIC 47PF 10% 150V
C50	1-102-246-00	CERAMIC 47PF 10% 150V
C51	1-102-246-00	CERAMIC 47PF 10% 150V
C52	1-102-246-00	CERAMIC 47PF 10% 150V
C53	1-102-246-00	CERAMIC 47PF 10% 150V
C54	1-102-246-00	CERAMIC 47PF 10% 150V
C55	1-102-246-00	CERAMIC 47PF 10% 150V
C56	1-102-246-00	CERAMIC 47PF 10% 150V
C57	1-102-246-00	CERAMIC 47PF 10% 150V
C58	1-102-246-00	CERAMIC 47PF 10% 150V
C59	1-102-246-00	CERAMIC 47PF 10% 150V
C60	1-102-363-00	CERAMIC 0.001 50V
C61	1-161-013-00	CERAMIC 0.01 10% 25V
C62	1-131-369-00	TANTALUM 4.7 10% 16V
C63	1-107-093-00	MICA 220PF 5% 50V
C64	1-161-013-00	CERAMIC 0.01 10% 25V
C65	1-102-246-00	CERAMIC 47PF 10% 150V
C66	1-107-157-00	MICA 27PF 5% 500V (PAL)
D1	8-719-911-19	1SS119
IC1	8-759-131-11	μPC311C: NEC
IC2	8-759-901-07	SN74LS107AN: TI
IC3	8-759-902-21	SN74LS221N: TI
IC4	8-757-731-00	CX773A: SONY
IC5	8-759-990-62	TL062CP: TI
IC6	8-757-903-00	CX7903: SONY
IC7	8-759-901-23	SN74LS123N: TI
IC8	8-759-135-80	μPC358C: NEC
IC9	8-759-240-53	TC4053BP: TOSHIBA
IC10	8-759-240-11	TC4011BP: TOSHIBA
L1	1-407-169-XX	MICRO 100
L2	1-407-169-XX	MICRO 100
L3	1-407-163-XX	MICRO 33
L4	1-407-164-XX	MICRO 39
L5	1-408-615-00	MICRO 100 (PAL)

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Ref. No.	Parts No.	Description
L5	1-408-021-00	MICRO 150 (PAL-M)
L6	1-407-164-XX	MICRO 39
L7	1-407-164-XX	MICRO 39
L8	1-407-164-XX	MICRO 39
L9	1-407-164-XX	MICRO 39
L10	1-407-164-XX	MICRO 39
L11	1-407-164-XX	MICRO 39
L12	1-407-163-XX	MICRO 33
L13	1-407-164-XX	MICRO 39
L14	1-408-616-00	MICRO 120 (PAL)
Q1	8-729-603-50	2SC403SP
Q2	8-729-178-54	2SC2785
Q3	8-729-178-54	2SC2785
Q4	8-729-117-54	2SA1175
Q5	8-729-117-54	2SA1175
Q6	8-729-178-54	2SC2785
Q7	8-729-117-54	2SA1175
Q8	8-729-603-50	2SC403SP
Q9	8-729-603-50	2SC403SP
Q10	8-765-212-20	2SA925
Q11	8-765-212-20	2SA925
Q12	8-729-117-54	2SA1175
Q13	8-723-304-00	2SK43-4
Q14	8-729-603-50	2SC403SP
R34	1-214-583-00	METAL 12K 1% 1/8W
R35	1-214-581-00	METAL 10K 1% 1/8W
R36	1-214-581-00	METAL 10K 1% 1/8W
R44	1-214-565-00	METAL 2.2K 1% 1/8W (PAL)
R44	1-214-567-00	METAL 2.7K 1% 1/8W (PAL-M)
R45	1-214-565-00	METAL 2.2K 1% 1/8W (PAL)
R45	1-214-563-00	METAL 1.8K 1% 1/8W (PAL-M)
R51	1-246-481-00	CARBON 2.2K 5% 1/4W
R65	1-214-592-00	METAL 30K 1% 1/8W
R67	1-214-581-00	METAL 10K 1% 1/8W
R68	1-214-588-00	METAL 20K 1% 1/8W
R73	1-214-591-00	METAL 27K 1% 1/8W
R74	1-214-592-00	METAL 30K 1% 1/8W
R82	1-214-170-00	METAL 39K 1% 1/4W
RV1	1-226-772-00	METAL 4.7K
RV2	1-226-703-00	METAL 10K

Ref. No.	Parts No.	Description
VCO1	1-527-585-00	17.734475MHz (PAL)
VCO1	1-527-798-00	14.3024MHz (PAL-M)
VCO2	1-527-729-00	14.1875MHz (PAL)
VCO2	1-527-478-00	14.31818MHz (PAL-M)

SG-35 BOARD (NTSC)

	A-7511-518-A	MOUNTED CIRCUIT BOARD "SG-35"
C1	1-161-013-00	CERAMIC 0.01 10% 25V
C2	1-161-013-00	CERAMIC 0.01 10% 25V
C3	1-131-377-00	TANTALUM 10 10% 10V
C4	1-107-079-00	MICA 56PF 5% 50V
C5	1-131-344-00	TANTALUM 0.33 10% 35V
C6	1-131-341-00	TANTALUM 0.1 10% 35V
C7	1-107-075-00	MICA 39PF 5% 50V
C8	1-131-341-00	TANTALUM 0.1 10% 35V
C9	1-161-013-00	CERAMIC 0.01 10% 25V
C10	1-131-380-00	TANTALUM 33 10% 10V
C11	1-131-374-00	TANTALUM 33 10% 16V
C12	1-131-374-00	TANTALUM 33 10% 16V
C13	1-107-208-00	MICA 18PF 5% 500V
C14	1-161-013-00	CERAMIC 0.01 10% 25V
C15	1-131-377-00	TANTALUM 10 10% 10V
C17	1-161-013-00	CERAMIC 0.01 10% 25V
C18	1-131-377-00	TANTALUM 10 10% 10V
C19	1-107-094-00	MICA 240PF 5% 50V
C20	1-131-377-00	TANTALUM 10 10% 10V
C21	1-131-380-00	TANTALUM 33 10% 10V
C22	1-161-013-00	CERAMIC 0.01 10% 25V
C24	1-131-347-00	TANTALUM 1 10% 35V
C26	1-161-013-00	CERAMIC 0.01 10% 25V
C27	1-161-013-00	CERAMIC 0.01 10% 25V
C28	1-131-380-00	TANTALUM 33 10% 10V
C29	1-107-077-00	MICA 47PF 5% 50V
C30	1-161-013-00	CERAMIC 0.01 10% 25V
C31	1-161-039-00	CERAMIC 0.001 10% 25V
C32	1-107-077-00	MICA 47PF 5% 50V
C33	1-161-013-00	CERAMIC 0.01 10% 25V

NOTE:

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Ref. No.	Parts No.	Description
C34	1-131-341-00	TANTALUM 0.1 10% 35V
C35	1-131-370-00	TANTALUM 6.8 10% 16V
C36	1-131-377-00	TANTALUM 10 10 10V
C37	1-161-013-00	CERAMIC 0.01 10% 25V
C38	1-107-208-00	MICA 18PF 5% 500V
C39	1-161-013-00	CERAMIC 0.01 10% 25V
C40	1-131-341-00	TANTALUM 0.1 10% 35V
C41	1-131-370-00	TANTALUM 6.8 10% 16V
C42	1-131-380-00	TANTALUM 33 10% 10V
C43	1-109-154-00	MICA 240PF 5% 300V
C44	1-108-227-00	MYLAR 0.001 10% 50V
C45	1-102-363-00	CERAMIC 0.001 50V
C46	1-102-242-00	CERAMIC 3PF ±0.5PF 50V
C47	1-102-363-00	CERAMIC 0.001 50V
C48	1-102-246-00	CERAMIC 47PF 10% 150V
C49	1-102-246-00	CERAMIC 47PF 10% 150V
C50	1-102-246-00	CERAMIC 47PF 10% 150V
C51	1-102-246-00	CERAMIC 47PF 10% 150V
C52	1-102-246-00	CERAMIC 47PF 10% 150V
C53	1-102-246-00	CERAMIC 47PF 10% 150V
C54	1-102-246-00	CERAMIC 47PF 10% 150V
C55	1-102-246-00	CERAMIC 47PF 10% 150V
C56	1-102-246-00	CERAMIC 47PF 10% 150V
C57	1-102-246-00	CERAMIC 47PF 10% 150V
C58	1-102-246-00	CERAMIC 47PF 10% 150V
C59	1-102-363-00	CERAMIC 0.001 50V
C60	1-131-369-00	TANTALUM 4.7 10% 16V
C61	1-107-177-00	MICA 220PF 5% 500V
C62	1-161-013-00	CERAMIC 0.01 10% 25V
C63	1-102-246-00	CERAMIC 47PF 10% 150V
D1	8-719-911-19	1SS119
D2	8-719-911-19	1SS119
IC1	8-759-131-11	μPC311C: NEC
IC2	8-759-901-07	SN74LS107AN: TI
IC3	8-759-902-21	SN74LS221N: TI
IC4	8-757-731-00	CX773A: SONY
IC5	8-759-990-62	TL062CP: TI
IC6	8-757-903-00	CX7903: SONY
IC7	8-759-901-23	SN74LS123N: TI
IC8	8-759-135-80	μPC358C: NEC
IC9	8-759-240-53	TC4053BP: TOSHIBA
IC10	8-759-220-00	TC40H000P: TOSHIBA

Ref. No.	Parts No.	Description
IC11	8-759-902-21	SN74LS221N: TI
IC12	8-759-045-57	MC14557BCP: MOTOROLA
IC13	8-759-240-11	TC4011BP: TOSHIBA
L1	1-407-169-XX	MICRO 100
L2	1-407-169-XX	MICRO 100
L3	1-407-163-XX	MICRO 33
L4	1-407-164-XX	MICRO 39
L5	1-408-021-00	MICRO 150
L6	1-407-164-XX	MICRO 39
L7	1-407-164-XX	MICRO 39
L8	1-407-164-XX	MICRO 39
L9	1-407-164-XX	MICRO 39
L10	1-407-164-XX	MICRO 39
L11	1-407-164-XX	MICRO 39
L12	1-407-164-XX	MICRO 39
Q1	8-729-603-50	2SC403SP
Q2	8-729-178-54	2SC2785
Q3	8-729-178-54	2SC2785
Q4	8-729-117-54	2SA1175
Q5	8-729-117-54	2SA1175
Q6	8-729-178-54	2SC2785
Q7	8-729-117-54	2SA1175
Q8	8-729-603-50	2SC403SP
Q9	8-729-603-50	2SC403SP
Q10	8-765-212-20	2SA925
Q11	8-765-212-20	2SA925
Q12	8-729-117-54	2SA1175
Q13	8-729-603-50	2SC403SP
R34	1-214-575-00	METAL 5.6K 1% 1/8W
R35	1-214-581-00	METAL 10K 1% 1/8W
R36	1-214-581-00	METAL 10K 1% 1/8W
R43	1-214-565-00	METAL 2.2K 1% 1/8W
R44	1-214-565-00	METAL 2.2K 1% 1/8W
R58	1-214-581-00	METAL 10K 1% 1/8W
R60	1-214-588-00	METAL 20K 1% 1/8W
R61	1-214-592-00	METAL 30K 1% 1/8W
R67	1-214-591-00	METAL 27K 1% 1/8W
R68	1-214-592-00	METAL 30K 1% 1/8W
R72	1-214-173-00	METAL 51K 1% 1/4W
R73	1-214-583-00	METAL 12K 1% 1/8W
R81	1-214-589-00	METAL 22K 1% 1/8W
R82	1-214-170-00	METAL 39K 1% 1/4W

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Ref. No.	Parts No.	Description
RV1	**1-226-772-00**	**METAL 4.7K**
RV2	**1-226-774-00**	**METAL 47K**
RV3	**1-226-774-00**	**METAL 47K**
RV4	**1-226-703-00**	**METAL 10K**
S1	**1-553-429-00**	**SLIDE**
VCO1	**1-527-478-00**	**14.31818MHz**

SW-4 BOARD

	1-610-328-00	PRINTED CIRCUIT BOARD "SW-4"
S1	**1-554-556-00**	**ROCKER "RGB DELAY"**
S2	**1-554-556-00**	**ROCKER "RGB DELAY"**

SW-5 BOARD

	1-610-329-00	PRINTED CIRCUIT BOARD "SW-5"

Ref. No.	Parts No.	Description

SW-21 BOARD

	1-610-436-00	PRINTED CIRCUIT BOARD "SW-21"
R1	**1-247-104-00**	**CARBON 75 5% 1/4W**
R2	**1-247-104-00**	**CARBON 75 5% 1/4W**
S1	**1-516-576-00**	**SLIDE**
S2	**1-516-576-00**	**SLIDE**
VDR1	**1-806-504-11**	**ERZ-C05DK820**
VDR2	**1-806-504-11**	**ERZ-C05DK820**
VDR3	**1-806-504-11**	**ERZ-C05DK820**
VDR4	**1-806-504-11**	**ERZ-C05DK820**
VDR5	**1-806-504-11**	**ERZ-C05DK820**
VDR6 ~ VDR11	**1-806-504-11**	**ERZ-C05DK820 (Serial No. 10201 and higher) (U/C) (Serial No. 10191 and higher) (AEP) (Serial No. 10011 and higher) (UK, BRZ)**

SW-90 BOARD

	1-610-327-00	PRINTED CIRCUIT BOARD "SW-90"
S1	**1-554-554-00**	**SLIDE**

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SECTION 10
MOUNTED CIRCUIT BOARDS AND SCHEMATIC DIAGRAM

MEASURING CONDITIONS OF VOLTAGE VALUE AND WAVEFORM

1. Conditions

The voltage value and waveform in all the schematic diagrams described in this manual are checked and shot under the same conditions.
The voltage value is also measured using a digital voltmeter (with an input resistance of 10 MΩ).

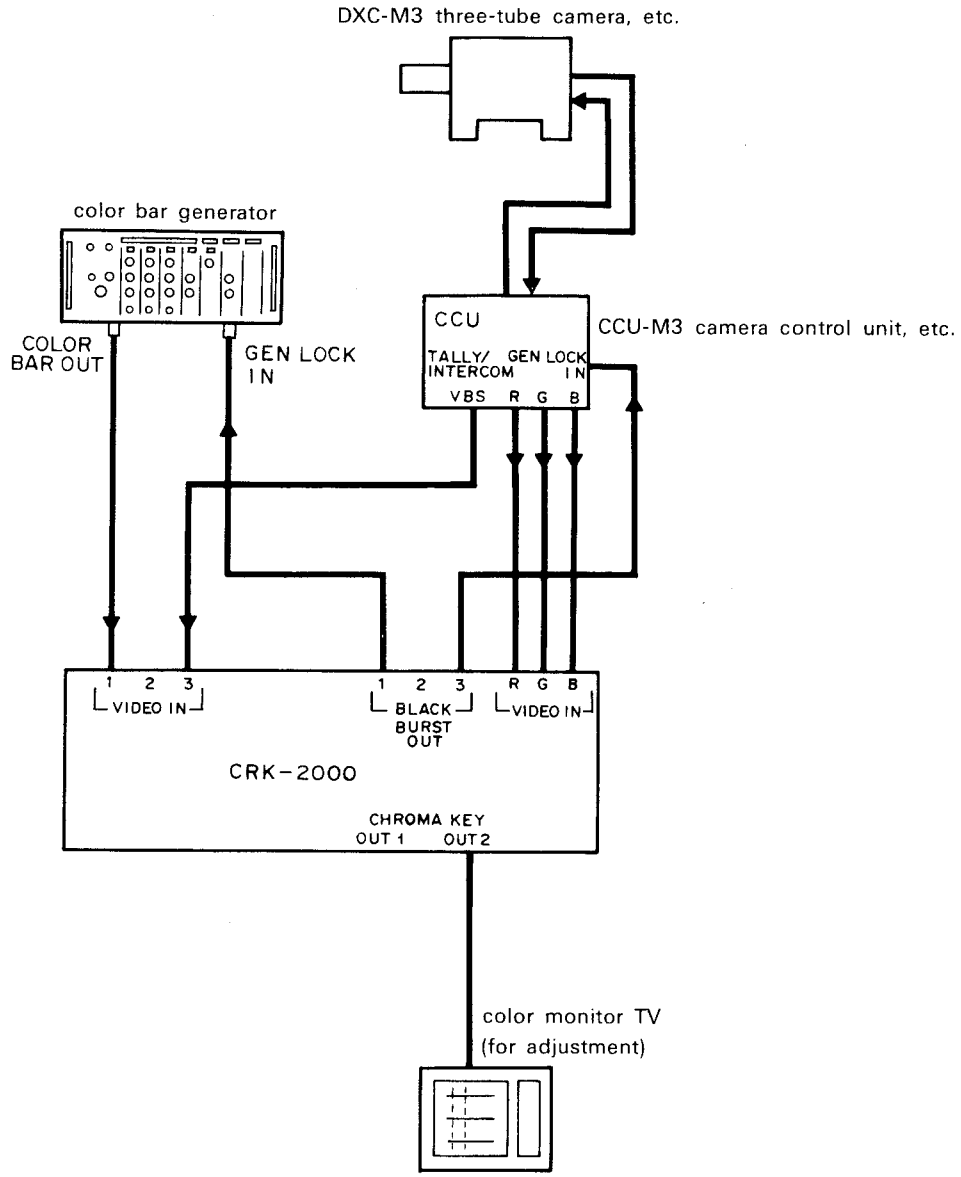
2. Setting Position of Switches

Power switch	: ON
CAMERA PHASE INDICATION switch	: ON
MODE select switch	: CHROMA KEY
Key bus select button	: 3 (RGB)
Insert bus select button	: 3

3. Equipment Used

- Digital voltmeter
- Dual trace oscilloscope
- Three-tube camera (based on full adjustment)
- Camera control unit (based on full adjustment)
- Color bar generator
- Color monitor TV

4. Connection Diagram



Ref. No.	Parts No.	Description
FRAME		
	⚠ 1-526-572-21	**VOLTAGE SELECT (PAL, PAL-M)**
CN101		
⌇	1-526-531-00	**RECEPTACLE, 4P FEMALE**
CN104		
CN105		
⌇	1-509-501-00	**RECEPTACLE, 4P MALE**
CN107		
CN108	1-509-422-XX	**RECEPTACLE, 6P FEMALE "B/W CAMERA"**
CN201		
⌇	1-561-781-21	**RECEPTACLE, BNC**
CN217		
⚠**CN301**	1-509-546-00	**"~AC IN"**
Q101		
⌇	8-729-315-63	**2SB856**
Q104		
VDR6		
⌇	1-806-504-11	**ERZ-C05DK820**
VDR11	**(Serial No. 10001~10200) (U/C)**	
	(Serial No. 10001~10190) (AEP)	
	(Serial No. 10001~10010) (UK, BRZ)	
⚠**S1**	1-554-555-11	**ROTALY "POWER" (NTSC)**
⚠**S1**	1-554-555-21	**POTALY "POWER" (PAL, PAL-M)**
⚠**T1**	1-447-635-00	**"POWER" WITH CONNECTOR (NTSC)**
⚠**T1**	1-447-634-00	**"POWER" WITH CONNECTOR (PAL, PAL-M)**
	1-509-921-00	PLUG HOUSING
	⚠ 1-535-047-00	**PLUG CONTACT**

Ref. No.	Parts No.	Description
PACKING MATERIAL AND ACCESSORY (SUPPLIED)		
	⚠ 1-551-812-00	**POWER CORD (U/C)**
	⚠ 1-556-760-00	**POWER CORD (PAL, PAL-M)**
	2-382-103-00	CHROMA
	2-382-133-00	CUSHION (FRONT)
	2-382-134-00	CUSHION (REAR)
	2-382-135-00	INDIVIDUAL CARTON
	2-382-136-00	CUSHION (UPPER)
	2-382-137-00	CUSHION (LOWER)
	3-701-625-00	**BAG, POLY (FOR POWER CORD)**
	3-701-630-00	**BAG, POLY (FOR MANUAL)**
	3-701-640-00	**BAG, POLY (FOR CRK-2000)**
	⚠ 3-773-452-11	**MANUAL INSTRUCTION (AEP, UK, BRZ)**
	⚠ 3-773-452-23	**MANUAL INSTRUCTION (U/C)**

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